



resurgent ecologies

a blue design

a new neighborhood

designed by: Sam

A Design Thesis Submitted to the Department of
Architecture and Landscape Architecture of North
Dakota State University

By
Samantha Lott

In Partial Fulfillment of the Requirement
for the Bachelor of Landscape Architecture



Primary Thesis Advisor


Thesis Committee Chair

May 2012
Fargo, ND

NON-EXCLUSIVE DISTRIBUTION LICENSE

By signing and submitting this license I, Samantha Lott, (the author(s) or copyright owner) grants to North Dakota State University (NDSU) the non-exclusive right to reproduce, translate (as defined below), and/or distribute my submission (including the abstract) worldwide in print and electronic format and in any medium, including but not limited to audio or video.

I agree that NDSU may, without changing the content, translate the submission to any medium or format for the purpose of preservation.

I also agree that NDSU may keep more than one copy of this submission for purposes of security, back-up and preservation.

I represent that the submission is my original work, and that I have the right to grant the rights contained in this license. I also represent that my submission does not, to the best of my knowledge, infringe upon anyone’s copyright.

If the submission contains material for which I do not hold copyright, I represent that I have obtained the unrestricted permission of the copyright owner to grant NDSU the rights required by this license, and that such third-party owned material is clearly identified and acknowledged within the text or content of the submission.





IF THE SUBMISSION IS BASED UPON WORK THAT HAS BEEN SPONSORED OR SUPPORTED BY AN AGENCY OR ORGANIZATION OTHER THAN NDSU, I REPRESENT THAT I HAVE FULFILLED ANY RIGHT OF REVIEW OR OTHER OBLIGATIONS REQUIRED BY SUCH CONTRACT OR AGREEMENT.

NDSU will clearly identify my name(s) as the author(s) or owner(s) of the submission, and will not make any alteration, other than as allowed by this license, to my submission.

Authors Signature

Date

table of contents

- abstract | 001
- problem statement | 002
- statement of intent | 003 
- proposal | 006 
- narrative | 007
- a user/client description | 008
- major project elements | 010
 - site information | 012
 - project emphasis | 015
 - plan for proceeding | 016
 - program | 018 
- theoretical premise/unifying idea | 019
- summary of research | 025
- results from typological research | 028
- case study series and typological summary | 040
 - historical context | 043
 - goals for project | 050
 - site analysis | qualitative | 053
 - site analysis | quantitative | 059
 - site analysis | climate data | 068
 - design | 078 
- programmatic requirements | 079
 - conceptual development | 080
 - detail development | 084
- leveraging social technology | augmented reality | 094
- conclusions | 102
- personal identification | 105
- previous studio experience | 107
- reference list | 108

abstract

This thesis explores a waterless neighborhood in Las Vegas. “Blue design” explores water conservation efforts through design and community planning. The intent of this project is to identify new and innovative ways to retain water on a neighborhood scale that in turn helps hydrate the greater Las Vegas area.

key words: water | conservation | urban | neighborhood | suburban retrofit | social technology | augmented reality

problem statement

How can a community deprived of water become an urban hub of conservation?

Statement of Intent

typology

A blue neighborhood; one that is derived from a water sensitive ecology.

claim

The Las Vegas community is in serious need of water; concerns about water wars have convinced residents of a need to conserve and reduce water consumption. Perhaps an effort from this community could result in an ecological and social revitalization of this region of our country.

premises

The actors are a Las Vegas community, tourists, designers, planners, engineers, and environmentalists.

The action is a design of a common residential site that communicates the importance of water protection in the Las Vegas valley.

The object acted upon is the Rhodes Ranch neighborhood in Las Vegas, Nevada.

The manner of action is a Las Vegas neighborhood that will use innovative design and social media to help budget water use.

supporting premises

The actors in this project will each play a different role. The Las Vegas community will work with planners and designers to create policies that will affect how they live. Designers will work with residents to help create an ecologically-sensitive common area.

The action will be completed through an analysis of storm water management practices and realized through Resurgent Ecologies.

The object acted upon will be determined through analysis of the land and economic status of the neighborhood.

The manner of action will be researched; through case studies and analysis, an investigation of the community will dictate the design.

Statement of Intent

theoretical premise/unifying idea

Our country is becoming increasingly urbanized; the indulgences of our ever increasing suburbia are becoming increasingly apparent. The idea of sustainable suburbs is complex and contains many issues. The increasingly sedentary suburban lifestyle and sustainable urban development do not currently coexist in a healthy manner in the Las Vegas Valley (Schaffer, 2010). The premise of this project is to explore the relationship between a community in Las Vegas, Nevada and its surrounding ecology.

project justification

Las Vegas is facing devastating drought. According to a study conducted by Scripps Institution of Oceanography, the city is forecast to run out of water in as few as 10 years; the Colorado River can no longer support the millions who rely on it (Green, Wise, & Sweet). Without an intervention, the greater Las Vegas area could have a dry and desolate future. Setting a precedent in this area will help ignite change for the Las Vegas community.



the proposal.

Narrative

The suburban neighborhoods of Las Vegas, Nevada may face many challenges in the near future. Ecological stresses, along with a lack of identity, create an uninteresting, undesirable place to live. Resurgent Ecologies will focus on the current relationship between a mid-altitude desert suburban development and its water ecology. Through sense of place and creative water management solutions, a new innovative residential amenity for this desert community can create a landscape ecology that can stimulate a movement for the rest of the Las Vegas area.

User/Client Description

The users and clients of this design are those living in the Las Vegas community or the surrounding area, tourists, businesses, designers, owners, and renters. No single user will own this project, all residents will be active in its success. Resurgent Ecologies aims to create a dynamic, ever-changing community that is driven by its residents. The proposed common area will be an asset for everyone living or working near its location.

user A: residents

Residents in this area are most directly impacted by “Blue Design.” They have the most responsibility as well. This group of people is invested financially and holds the greatest power to protect and conserve damaged ecology. The design of this project must accommodate these needs.

user B: tourists

In 2004, the tourism industry brought in \$33.7 billion (Las Vegas: Economy, n.d.). Tourists are a key group of people in Las Vegas; the vast number of people who visit this area provide an important economic viability for the residents of Las Vegas. For this reason, this group of people greatly influences the decisions of the locals.

user C: city of Las Vegas

The city of Las Vegas will be impacted in a variety of ways. The city will be in charge of the maintenance of any public works designed in this thesis. This group also affects the policies and zoning laws in Las Vegas. It will be imperative to work with this group and its vision plans.

user D: educators

This group of people will help inform and influence the design. Educators play a large role in decision making and can affect policy makers. Their role will be important moving forward with this thesis.



[8]

[9]

the proposal.

major project elements

scope

The overall scope of this project varies on the involvement of the residents. All user groups have a financial and emotional investment, therefore need to be involved. The overall framework of this project will be developed through analysis of both land and community. There are a few important elements to address: infrastructure, reevaluation of recreational land, stormwater management, and creative residential design. The major project elements are outlined in the following section.

major project elements

water management

An environmental analysis will be made regarding water management practices in the greater Las Vegas area. Providing more opportunities for residents to retain water on site could help improve in their water dilemma.

suburban moudus operandi

A new desgin for the Rhodes Ranch neighborhood in Las Vegas could provide an identity as well as a sense of place for residents. Las Vegas, NV is a typical example of sprawl and massive construction development. With many homes foreclosed (Las Vegas Foreclosures, n.d.) developers must look for new and innovative homes to attract buyers and renters.

reevaluation of recreational land

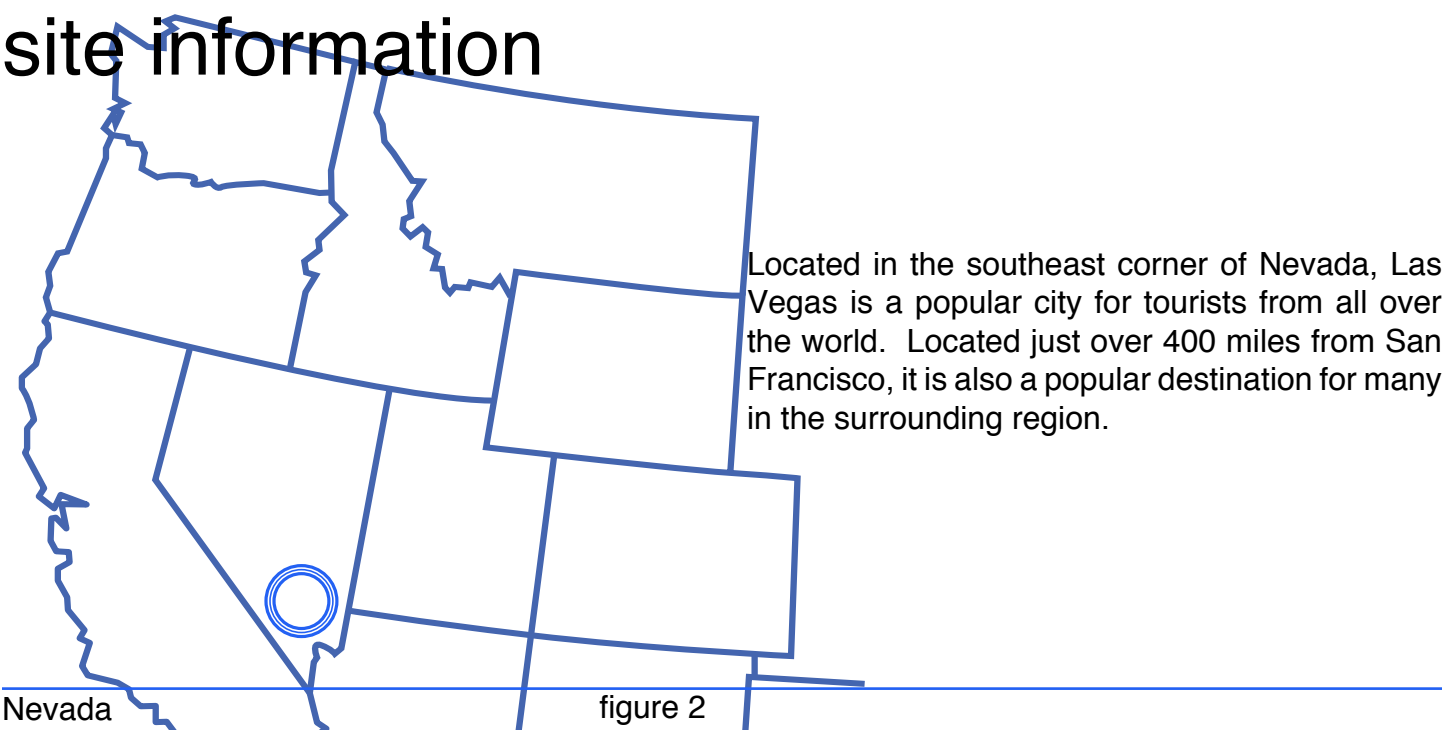
Golf courses have become financially unsustainable in many urban cities across the nation (Harnik, & Donahue, n.d.). An analysis of the bountiful golf courses in this area may reveal a possibility for the reclamation of these green spaces. With public parks and open spaces limited, these areas could set a precedent for a new use of recreational land. The ecological effect that these massive greenspaces have on our environment will be evaluated as well.

infrastructure

The grey network (described as streets and hard infrastructure) for this particular neighborhood will affect the commutability of the residents and tourists. A new infrastructure will improve the quality of transportation for residents while allowing tourists greater ease in visiting/navigating the area. The new network will also play a large role in establishing the sense of place as well.



site information



The Rhodes Ranch neighborhood is positioned in the southwest section of Las Vegas.



A small golf course is located in the center of the neighborhood. Larger sized roads circulate around this node. The basic layout of this area mimics a typical sprawl neighborhood with dead-end streets.

site information

The typical sprawl-like pattern of the Rhodes Ranch Neighborhood makes this site a good choice for an intervention. A small golf course is located in the center; this creates a focal point or an area of interest to study. Most of the required infrastructure currently exists; this will allow for focus on other areas. An analysis of foreclosed homes in this area also makes it an appropriate site (Las Vegas Foreclosures n.d.).



aerial image of site

site information

geographic



personal photo

Spring Mountain Range



personal photo

cut bank



personal photo

dam for storage



personal photo

sandy soil

project emphasis

theoretical premise/unifying idea

Our country is becoming increasingly urbanized; the development of our suburbs have begun to reflect this phenomenon. The idea of sustainable suburbs is complex and contains many issues. There exists a contradiction between the increasingly sedentary suburban lifestyle and sustainable urban development (Schaffer, 2010). The premise of this project is to explore the relationship between a community in Las Vegas, Nevada and its surrounding ecology.

Blue design will address a neighborhood in Las Vegas and emphasize a water management plan along with creative residential design. It will address the connection people have with the environment; that connection will be realized through the design.

Plan for Proceeding

research direction

The direction of research for this project will be fulfilled through a variety of means. It will be realized through an analysis of the land and community. Case studies will be investigated and then compared to this site. The research will be conducted through the theoretical premise/unifying idea, project typology, historical context, site analysis, and programmatic requirements.

methodology

The mixed method quantitative/qualitative analysis technique will be used in this thesis. Both quantitative and qualitative data will be collected simultaneously. The priority of the research will be determined by the theoretical premise/unifying idea. This process will continue throughout the project at every stage. All reports will be analyzed, interpreted, and reported. Information will be reported in both text and graphics.

Quantitative data will be organized through both statistical and scientific data. On-site measurements as well as archival research will be conducted. Qualitative data will be collected from a site visit, surveying, observation, archival research, and interviews.

documenting the design process

Documentation of the design process will occur through digital media, such as (but not excluded to) augmented reality, photography, mapping, images, and 3-D modeling. It will be preserved and made available to scholars through the online library database at North Dakota State University. Physical boards as well as a digital presentation will be presented at the conclusion of this process. Work will be submitted at biweekly intervals. The majority of the design process will happen during the spring semester.



the program.



[18]

Theoretical Premise/Unifying Idea Research

Retrofitting Suburbia

The development of our suburban cities in the United States of America has consistently been growing in an unsustainable manner. This trend has even been recognized at a national level; According to *Pathways to Urban Sustainability: Research and Development on Urban Systems*, the first director of the nation's Office of Urban Affairs, Adolfo Carrion said, "The United States is becoming more urbanized and the current trend is unsustainable. Our sprawl, the way we continue to spread over the land, the amount of pollution that we create, the inefficiencies that we support, how we have allowed development to take place, doesn't make sense anymore (Schaffer, 2010 pg. 18)."

As a country, we have known about this trend for decades but have failed to find a permanent solution. Carrion worries about what kind of planet we will leave for future generations (Schaffer ,2010). He suggests that our focus should be on how to "grow our country [and begin a] conversation on how we plan to live" (Schaffer 2010 pg. 18)."

The book, *Pathways to Urban Sustainability: Research and Development on Urban Systems* explains how our path to sustainable cities is a process, not a goal (Schaffer, 2010). This idea examines the flexibility of our nation's policies. There are many barriers that inhibit this practice. Schaffer (2010) outlines the economic obstacles we face,

[19]

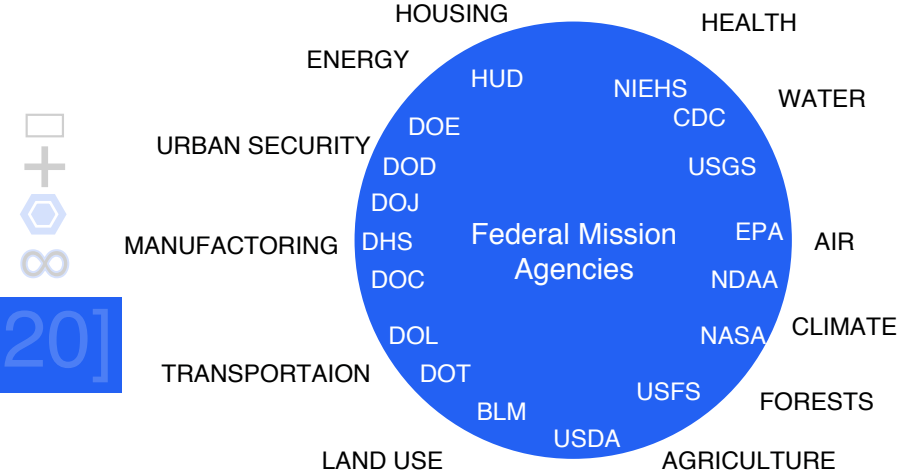
the program.

“for example, nothing is sustainable if poverty and hunger persist; economic insecurity will always trump sustainability (pg.19).”

There will always be more pressing issues that take precedent over sustainable growth in our government, such as the nation’s wealth and security; however, its role in the process is especially important in the theory of change.

Not only does our country lack focus, but we are disorganized at both the federal level in our government as well as the state and local levels (Schaffer, 2010). Our approach to urban sustainability is very fragmented; see diagram below:

Federal Approach to Urban Systems is Fragmented



State and Local Agencies Have the Same Problem

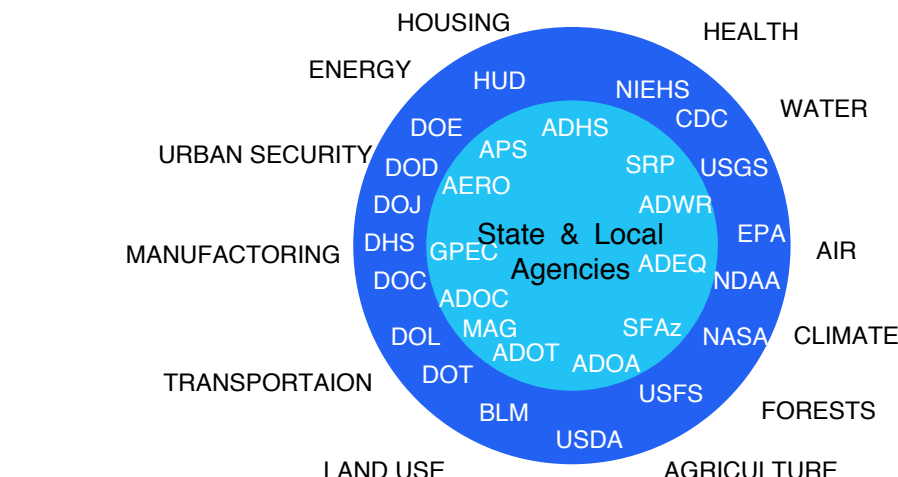


figure 6

There is now a push for integrated research networks. These networks include social scientists, natural and physical scientists, engineers, and planners; many organizations within the government are looking for partnerships as well (Schaffer 2010).

There are spatial specifications that determine how cities develop; where the roads, houses, parklands, retail stores, and factories are built all contribute to the sustainability of a city (Schaffer, 2010). So how do all these factors contribute to urban sprawl and sustainable design?

The director of Housing and Urban Development, Michael Freedberg, cited the fundamentals of good urban growth as housing and transportation during a meeting of the Committee on the Challenge of Developing Sustainable Urban Systems. There are six principles:

According to Freedburg, “providing more transportation options that aren’t reliant on the automobile, building not only affordable housing but housing that meets the needs of diverse demographic groups, increasing economic competitiveness between jobs in the suburbs and jobs in our cities, creating neighborhoods that are engaged in sustainable practices that benefit supporting neighborhoods as well, investment at the federal level and finally investing in healthy, safe, walkable cities.” (Schaffer, 2010 pg. 19).

Developing these principles can have significant land use advantages.

Health Benefits of Sustainable Suburban Design

One of the fundamental goals of sustainable design is the quality of public health. Howard Frumkin, the director of the National Center for Environment and Health Agency for Toxic Substances and Disease Registry at the U.S. Centers for Disease Control said, “Public health is intrinsic to sustainability” (Schaffer, 2010 pg. 21).

As our population continues to live sedentary lives, our overall health continues to decline. Frumkin acknowledges that the “car-culture landscapes” seen in suburbia have led to a decline in our nation’s health. He illustrated this using the construction of Hubbard Lake Elementary School in Hubbard Lake, Michigan; the school is located seven miles from the nearest student. This is not an atypical situation in many low density communities (Schaffer 2010).

Frumkin then went on to conclude that with a less car-centralized city, walking would increase and vehicular injuries would decrease. Sustainable suburban design has opportunities for stronger, healthier communities.



Large suburban street

figure 7

Value of Land

Given the challenges of sustainable suburban design, evaluations of land use must be done. Specifically, use of public golf courses is under inspection. Public golf courses are parks in every sense, but they do carry limitations. Currently the national median weekend fees at municipal courses are \$36 and are typically between 100-150 acres (Harnik, 2011). Since that there is a fee associated with them, it is difficult to attach the word “public” to them.

Meredith Thomas, the director of San Francisco’s Neighborhood Parks Council said, “Continuing to invest in golf courses that are not financially self-sustaining at the cost of other urban recreation is completely unjustifiable” (Harnik, 2011). Thomas continued to compare golf courses to sprawl in cities, “other forms of recreation like field sports and off-leash dog areas are bursting at the seams. [Underused and unsustainable golf courses] are counter to San Francisco’s definition of livability” (Harnik 2011).

One key factor keeping public golf courses from being sustainable and efficient is the decline in golf participation; it is not growing as fast our population. With interest shifting toward self-directed activities (including running and cycling) golf has taken a back seat. According to Peter Harnik ASLA, “in the late 1980s, the average course saw about 40,000 rounds a year, that number has fallen to about 33,000 today. A 2004 study of recreation facility desires of San Francisco households found that golf ranked 16th out of 19 amenities; highest on the wish list were trails, pools, and community gardens (Harnik, 2011).”



Public golf course in Las Vegas

figure 8

This is not to say that golf courses do not have their place in cities. Golf provides many health benefits; the typical golfer is also well-educated, older, and articulate (Harnik, 2011). What is under investigation is the value that public golf courses have in our park systems.

Many cities have begun to recognize these inconsistencies and are aiming for a compromise. Seattle’s most recent master plan outlines trails that extend the perimeter of each of the city’s public courses. They have coyly named another initiative, “Birds Without Birdies,” which allows golfers and birdwatchers the room to enjoy the public space (Harnik, 2011).

Theoretical Premise/Unifying Idea Research

Summary of Research

Research has found that our nation’s urban cities have developed unsustainably and land use is inefficient.

It is important to understand the goal of “sustainable urban cities” is not just a goal, but a process. We must all be educated on the challenges we face and work together to continue this process.

As a country we face many challenges at both the state and federal levels. Sustainable living is a very complex issue and is limited by many policies in our government. Basic needs such as hunger and our Gross Domestic Product will always trump the needs of sustainable lifestyles.

The structure of the organizations within our government hinders progress as well. Although intentions are good, many groups find it difficult to accomplish tasks because partnerships are often not well established. Overlapping research teams must be assembled to help advance the suburban sustainable movement.

There are six principles to good suburban design: providing more transportation options that aren't reliant on the automobile, building not only affordable housing, but housing that meets the needs of diverse demographic groups, increasing economic competitiveness between jobs in the suburbs and jobs in the cities, creating neighborhoods that are engaged in sustainable practices that benefit supporting neighborhoods as well, investment at the federal level, and finally, investing in healthy, safe, walkable cities (Schaffer, 2010). These factors can be used as a framework for future development.

Sustainable suburban neighborhoods not only improve ecology, but there are numerous health benefits associated as well. When people live close to schools, work, and stores, they rely less on vehicles and inevitably get more exercise. Part of the process of sustainability should include a movement away from car-reliant societies.

Finally, the ongoing evaluation of land use is vital to sustainability. The study of public golf courses concluded that they are an inefficient use of space. With golf participation in decline, so is the need for such public amenities.



Results from Typological Research

Case Study One: Urban Reserve

Location: Dallas, TX
Developer: Diane Cheatham
Landscape Architect: Kevin Sloan
Water Garden Specialist: Steve Moeller
Site size: 12 acres
Date: 2004

Urban Reserve is an innovative suburban community located in Dallas, Texas; the developer, Diane Cheatham stated in an article in *Landscape Architecture* that the target audience intended to live in this community are “enthusiasts for modern architecture” (Dillon, 2009). The project is an example of an inventive use of thoughtful stormwater management retention and exemplifies sustainable living that challenges the norms of our traditional cul-de-sac suburban communities.



Urban Reserve: Dalas, TX

figure 9

In 2004 Dallas developer Diane Cheatham purchased 12 acres of land in a suburban Dallas community; the site was originally an illegal landfill where various contractors in the area dumped concrete, shingles, pipes, and debris. Cheatham saw this as an opportunity to develop the site into an ecologically sensitive neighborhood for people interested in modern architecture. Since the beginning of the project she has sold 26 of the 50 lots (Dillon, 2009).

The homes in the neighborhood represent very modern designs: they include Corbusian cubes, corrugated metal boxes and Texas ranch-style homes. The landscape plays an essential role in the aesthetics of the development. The plantings and design blend the entire neighborhood into a cohesive design (Dillon 2009). The entire reserve serves as a setting for distinctive architecture. The plantings are multi-functional as well.

One important function is the collection and cleansing of stormwater on the site; the only street that runs through Urban Reserve has a wet side and a dry side. The value of one street versus multiple is the decrease in the amount of impermeable surfaces significantly decreases the overall stormwater runoff (Dillon, 2009). Water drains off the street towards the wet side into a series of rain gardens that are planted with bald cypress and horsetail reeds; the water then travels to a series of retention ponds through pipes below the gardens. These ponds then filter the runoff so that it can be used for agriculture (Dillon, 2009). The dry side of the street holds specific plantings that are much more drought tolerant: desert willows are separated by green colored crushed granite which takes the place of water demanding grass. Other plantings used in the stormwater system include cottonwood, red oak, forsythia, sunflowers, weeping willows, and love grass (Dillon, 2009). Replacing traditional Bermuda grass has allowed the community to be much more conscious of the area in which they live.



Master plan of Urban Reserve

figure 10

The landscape architect for this project, Kevin Sloan, was very deliberate in integrating the history of the area with the ecology of the region. Glimpses of the old landfill can be seen at various locations; debris and concrete poke through the plantings (Dillon 2009). Materials left over from the site are used in creative and inventive ways as well. Slabs of concrete and rubble were transformed into curbs, retaining walls, and paths. In the article “Unexpected Dallas,” Sloan said, “The landscape becomes something by doing something” (Dillon 2009 pg. 45).



Native plantings provide a backdrop for the neighborhood.

Urban Reserve is slowly becoming popular in the Dallas community. This neighborhood has become a framework for innovative and new suburban design. It is drought resistant, appropriate for its setting and low maintenance (Dillon, 2009). Deborah Orrill, a resident of the reserve, said, “We aren’t into all the big house stuff, the pool and huge lawn, having to mow the grass only once a year sounded great to us (Dillon 2009).” Other neighborhoods could use Urban Reserve as an example. One day our nation could use this standard for suburban neighborhoods energy efficiency and sustainable design just as Urban Reserve is.



Urban Reserve

figure 12

Case Study Two: Chambers Bay Golf Course

Location: Tacoma, WA
Landscape Architecture Firm: Palo Alto, CA
Course Superintendent: David Wienecke
Site size: 300 acres
Date: 2007

Few public golf courses in the United States express such a rich history of industrialization and mining as Chambers Bay Golf Course does. Located in Tacoma, Washington, this 300 acre course sits in an abandoned gravel pit along two miles of the Puget Sound shoreline (Newcomb, 2009). Today the golf course uses new stormwater management techniques and celebrates the site’s previous use.



Chambers Bay Golf Course

figure 13



Sand dunes create landscape

figure 14

Significant landscape features were left behind from the site's previous mining operations. Although the site was abandoned in the 1980s, old mining structures, a massive concrete "swing set," two high ridges on two sides and a flat mine pit near the water still remain (Newcomb, 2009). Landscape Architects Jay Blasi, Robert Trent Jones Jr., Bruce Charlton, and Jerry Coburn oversaw the transportation of 1.5 million cubic yards of earth on the site. The team turned the site's defects into assets. The large gravel pit became a sand-sifting station; because not all sand-size particles could be used for the base of the golf course, "good sand" was sifted and then redistributed along the site (Newcomb, 2009). The landscape architects on the team were very careful with the design of the sand dunes. One member of the team, Jay Blasi said, "The great thing, from a design perspective, is that the places where they needed to mine for good sand were also the places they wanted to lower the land for the good of the finished landscape. The places that needed good sand added were also the places they wanted to fill in (Newcomb 2009)."

The amount of earth removal and redistribution is impressive.

Another important goal of the design team was the connection to the Puget Sound shore. This was accomplished through the creation of a tiered system, which allows views of the water from every hole along the course (Newcomb, 2009). The system is successful because the holes appear closer to the water than they actually are; the first hole starts at the lowest elevations while holes two and three are located above holes sixteen and seventeen. The meticulously designed elevation changes create long open views of the beautiful shoreline (Newcomb, 2009). Chambers Bay Golf Course has become a very interesting and exciting public park for the city.

What makes Chambers Bay Golf Course a successful public park is the incorporation of the public. Jerry Coburn of GCH Planning and Landscape Architecture, located in Seattle, Washington, oversaw the design of the two attached parks (North Meadow and Central Meadow) and the three-mile Soundview Trail (Newcomb, 2009).

Central Meadow Park has become a popular location for concerts, kite-flying, and pedestrian walkways. Significant artifacts remain from the site's gravel mining days; the large concrete "swing set" and massive sorting bins are nestled in the park and can be seen by both pedestrians and golfers (Newcomb, 2009).

Special care was taken with the design of the Soundview Trail. Corbun worked closely with Landscape Architect Jay Blasi so that pedestrians could enjoy the meticulously designed views of Puget Sound without disturbing golfers and still be protected from flyaway balls. Carefully placed berms and plantings help protect the trail. The trail rises 250 feet from the south side to the north side while meandering through a variety of environments (Newcomb, 2009). The path intersects with the golfers at the iconic Douglas fir tree on the site; the tree is the only surviving tree from the site's mining days. Landscape architects and planners were careful to highlight this landscape element to create a beautiful view of the lone tree (Newcomb, 2009).



Lone Douglas fir figure 16



Park for pedestrians figure 17

Other plantings at Chambers Bay Golf Course have become exceedingly important to the overall function of the park. Rather than utilizing traditional bluegrass, bentgrass, and ryegrass, designers chose to use fescue. The sand processed and distributed across the site became the perfect soil for the fescue to grow. Golf carts are prohibited on the course because they can destroy the grass; the game must be played in its traditional form (Newcomb, 2009).



Original concrete structures figure 18

The major benefit of using fescue grass is it significantly reduces irrigation needs; this also keeps the turf's roots at 12 inches, which is very high for the industry. Stormwater runoff is kept on-site and drains very well; the high sand content allows water to percolate (Newcomb, 2009). Chambers Bay Golf Course superintendent David Wienecke said, "Last year we reduced irrigation eighteen percent over the previous year (Newcomb, 2009)." These sustainable practices have become an important and sometimes challenging part of this project.

Customer surveys have questioned these practices. Many golfers are not accustomed to the fescue grass and claim it affects their game. Wienecke has continuously struggled to mow and change the grass in order to compromise (Newcomb, 2009). The public's demand for lush green fairways have also conflicted with the designer's sustainable golf course intentions; Blasi stated in an article for *Landscape Architecture*, "Green is actually bad. Brown is good. We look for browns, purples, and off greens" (Newcomb, 2009). Wienecke hopes that through education, peoples' perception of the sustainable space can shift (Newcomb 2009).

Although there has been some hesitation about the sustainable practices seen at Chambers Bay Golf Course, the park has become a championship course (Newcomb, 2009). The course shows great ingenuity and originality. The mix of public spaces and fairway is a wonderful combination. Focusing on the history of the site and the views it offers has made this park a beautiful and sustainable place to visit.

Case Study Three: Clark County Wetlands Park

Location: Las Vegas, NV
Landscape Architect: Fred Phillips
Client: Southern Nevada Water Authority (SNWA)
Site size: 2,000 acres
Date: 2004

Historically the Las Vegas Wash was a lush wetland oasis in the arid Las Vegas climate (Las Vegas Wash, 2010). The Wash’s water supply may be surprising to some though. Water reaches the wetland through urban runoff, shallow ground water, reclaimed water and stormwater (Las Vegas Wash, 2010). The water then makes its way through 2,000 acres of constructed wetlands to Lake Mead (Fred Phillips Consulting, 2011). The project may be an example of a positive reuse of grey water, there are problems. Periodic flooding in the region combined with the artificial flow caused significant erosion; this process led to massive cut banks, loss of wetlands, invasive species and sedimentation of Lake Mead, along with many other problems (Fred Phillips Consulting, 2011). Reclamation of these valuable wetlands in Las Vegas became an important goal of the Southern Nevada Water Authority.



Las Vegas Wash (Clark County Wetlands Park)

figure 19



Master Plan figure 20

The four sources of water input (reclaimed water, shallow ground water, urban runoff, and stormwater runoff) account for a large amount of water flow per day. According to the Las Vegas Wash Coordination Committee, the Las Vegas Wash filters approximately 153 million gallons per day (236 cubic feet per second) in about 12 miles of channels (Las Vegas Wash, 2010).

Urban runoff contributes a considerable amount of water to the marshes. The Las Vegas Wash Coordination Committee defines urban runoff as “a non-point source of pollution and is generally attributed to excess water used in the urban landscape, draining pools to streets, washing vehicles in streets, and hosing down driveways” (Las Vegas Wash, 2010). What makes this source significant is the amount of pollutants it carries to our water systems. Shallow ground water plays a large role in the hydrologic cycle. Ground water in Las Vegas is relatively shallow compared to other regions in the world (Las Vegas Wash. 2010). It is not suitable for drinking but is significant to the Las Vegas Wash because it flows in the same direction as the Wash (Las Vegas Wash 2010). Although the ground water does not contribute a large volume of water, it is an important process to monitor (Las Vegas Wash, 2010). Reclaimed water is often known as grey water.



Section of Bike Path

figure 21

Homes and businesses in southern Nevada demand a lot of water; as they grow, so does the water that passes through the Wash. Finally, stormwater is most often the most unpredictable input of water (Las Vegas Wash 2010). Providing a place for the water to slow down and filter is vital to the health of the watershed in Las Vegas. The large quantity of water that passes through the Wash every day calls for a reclamation of these important wetlands.

The Fred Phillips Consulting Firm designed a master plan for the area that called for significant revegetation of the Wash (Fred Phillips Consulting, 2011). According to the company, “The plan sites along the wash are ranked based on revegetation priority and feasibility in descriptive and GIS format. This plan outlines and details the necessary steps to successful revegetation projects, from project compliance planning to revegetation project monitoring and maintenance” (Fred Phillips Consulting, 2011). The firm also compiled a regulation plan that included a planting matrix, detailed maps, planting implementation, irrigation design and project monitoring and maintenance. The Southern Nevada Water Authority has utilized its plan and has revegetated more than 90 acres of the Las Vegas Wash (Fred Phillips Consulting, 2011).



Trail Head

figure 22

Other innovative solutions are being explored as well. On March 13, 2007, the Stardust Casino was demolished, and 170,000 tons of debris resulted from the explosion; the Southern Nevada Water Authority used this material as rip rap to help stabilize the channel (Las Vegas Wash, 2010). The Las Vegas Wash Coordination Committee is very proud of the recycling of the famous material “Demolished hotel material acquisition has proven to be an invaluable method for meeting ecosystem restoration goals along the Wash. The recycling of material on such a large scale is certainly a better alternative to simply land filling the material. The program truly exemplifies the trash-to-treasure ideal, and may serve as an example to future generations and neighboring cities (Las Vegas Wash 2010).”

What was once a project of innovative stormwater sequestration has now become an innovative use of recycled material. The Las Vegas Wash is slowly becoming a wetland oasis in the center of a desert again. With the help of many volunteers, the rich, diverse ecosystem is slowly on its way of being a water-efficient design used to improve water quality in a water-starved community.

Case Studies Series and Typological Summary

Throughout the typological research process, many observations were made. The advanced stormwater management practices located in Urban Reserve provided a possible solution to the investigation of suburban neighborhoods' ecological issues. Research on the value of public golf courses in the United States was questioned with the design of Chambers Bay Golf Course in Tacoma. Finally, the Las Vegas Wash, located in the Clark County Wetlands, provided a basis for ecological solutions in Las Vegas's arid climate. These case studies provided an argument both for and against the preliminary research.

The first typological research investigated included the design and master plan of the Urban Reserve neighborhood in Dallas. The site's original state shows the possibilities of change in residential communities. An impressive transformation from the landfill to a modern stormwater sensitive neighborhood provides appropriate groundwork for the future design process.



Urban Reserve

figure 12

The second case study researched was Chambers Bay Golf Course. This park provided an argument for the benefit of public golf courses in city planning. The design successfully merged two parks and a pedestrian trail along a public golf course. What makes this design even more unique is the use of fescue grass as the primary planting; the stormwater retention benefit it provides for the site is nothing short of innovative. The spatial relationships the design provides are also innovative and educational as.

Finally, the third case study investigated the Las Vegas Wash and the restoration actions taking place to help restore the unique wetlands. The water source provides an inventive use of grey water. Reusing water from human sources can provide an example for future water reuse. The Las Vegas Wash may help the community with its future water needs.

These typological studies provide a basis for future analysis and design. Along with research of the theoretical premise, these case studies helped develop the programmatic requirements for Blue Design.



Chambers Bay Golf Course

figure 13

Historical Context

Las Vegas’s neighborhoods reflect an unsustainable, water thirsty community. This problem is a result of many events throughout history. Rapid development and a limited source of water tell the story.

Settlers

Over the past 2,000-plus years, Las Vegas has seen a variety of diverse settlers who have all used the land differently. Las Vegas’s existence as we know it is contingent on one resource now: water. Historically, though, the city was a lush desert oasis that survived off of springs; many occupied this area of rich water supply and found ways to survive (Chung, 2002).

Two thousand years ago, the Anasazi Indians and Pautite people inhabited southern Nevada. These communities lived along the Muddy and Virigin rivers; evidence still exists on the landscape in ruins called the “Lost City” (History, 2010). Today, tourists can visit Overton, Nevada and explore the remaining artifacts (Lost City Nevada, n.d.). Unique construction techniques were used to form shelter; according to the Lost City Nevada-Reconstruction of Adobe Structures, “The ‘bottom’ course of each wall had at least a row of uniformly shaped, lenticular, usually quartzite, river rocks that were set on end, end to end in rows parallel to what would be the outer surface of the wall” (Lost City Nevada, n.d.).” Surrounding material was an important resource for the Anasazi Indians. Eventually these people moved on to explore other areas in the southwest.



Recreated structure from the “Lost City”
figure 23

The first European to settle in Las Vegas was a Spanish scout named Rafael Rivera. Upon his arrival to the area, Rivera discovered an abundant amount of grasses and flowers growing in the middle of the desert; he named the valley Las Vegas, which is Spanish for “The Meadows” (History, 2010). Although Native Americans knew about the springs for thousands of years, Rivera’s discovery spurred the movement of Western culture. Travel diaries and maps tell a story of four large springs that fed multiple basins of water, which allowed a much needed water supply for visitors. There is unfortunately no photographic evidence of “The Meadows” until the twentieth century (Chung, 2002). Below is one of the first photographs taken; it represents what the first settlers may have discovered.



Picture of former Las Vegas spring
figure 24

Agriculture and Mining Industry

One surprising, but important, group that settled of this area is the Mormon community. The abundant amount of water available allowed Mormon missionaries from Salt Lake City, Utah to farm the land (Chung, 2002). Although the natural springs allowed them to irrigate the land, the Nevada climate was very harsh. In 1855, a fort was built halfway between Salt Lake City and Los Angeles, where they would gather supplies, receive protection and rest (History, 2010). Various people have occupied the fort since its abandonment in 1858. In January 2000, the property opened after a lengthy restoration as the Old Las Vegas Mormon Fort State Historic Park (Chung, 2002).



Original Mormon fort
figure 25

During the late 1800s, the discovery of rich minerals and precious metals spurred the mining industry in Las Vegas. This industry, along with the State Land Act of 1885 caused a significant population increase. The State Land Act sold sections of land at \$1.25 per acre, which encouraged farmers to migrate to Las Vegas. Agriculture, ironically, became the dominant industry for the next 20 years (History 2010). The story of Las Vegas’s water demand is an obvious prelude to today’s problems.



Fort today - popular tourist location

figure 26

During the early 1900s the completion of the main railroad linked southern California to Salt Lake City, establishing Las Vegas as a railroad community. Las Vegas became a popular stop between the two cities, and the water allowed people to rest before continuing on their journeys (History, 2010). A mission-style railroad depot played a large role in the development of downtown Las Vegas. Fremont Street and Main Street became important roads for development. Today, the depot is a building of the past; the Plaza Hotel now stands in its original location (Chung, 2002).



Original railroad depot

figure 27

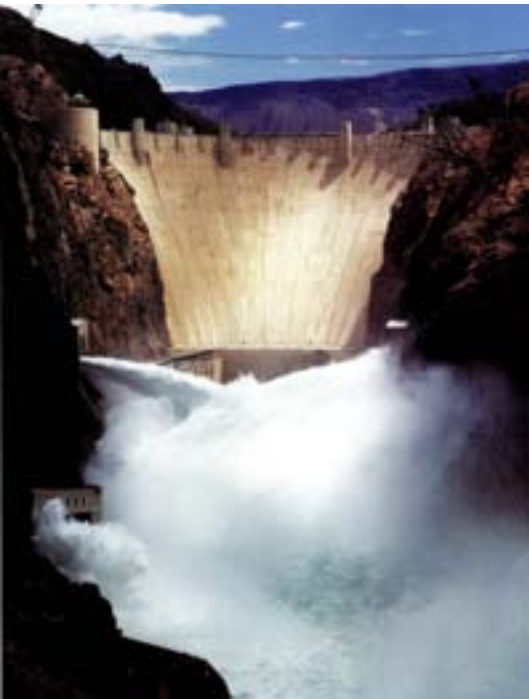
Hoover Dam

In 1931 Las Vegas saw its first large population boom (History, 2010). The Great Depression had tightened its grip around the nation’s economy and people, and the construction of the Bolder (now Hoover) Dam offered paychecks to thousands of construction workers (Chung, 2002). This project kept Las Vegas’ economy alive during a difficult time in the country. Many tourists came to watch the construction of the engineering marvel; the city saw this as an opportunity to help sustain itself. Las Vegas cleverly nicknamed itself the “Gateway to Boulder Dam” (Chung, 2002). The city began to define its future culture at this time as well. In March 1931, the state legislature officially legalized gambling. This time in history became paramount to the success of Las Vegas. By the 1940s, the city’s population had reached 8,422 people (History, 2010). With people gravitating to Las Vegas, for work, a huge change began for the city.



Colorado River before Hoover Dam

figure 28



Hoover Dam today

figure 29

Hotel Boom and Massive Growth



1960s hotel growth figure 30

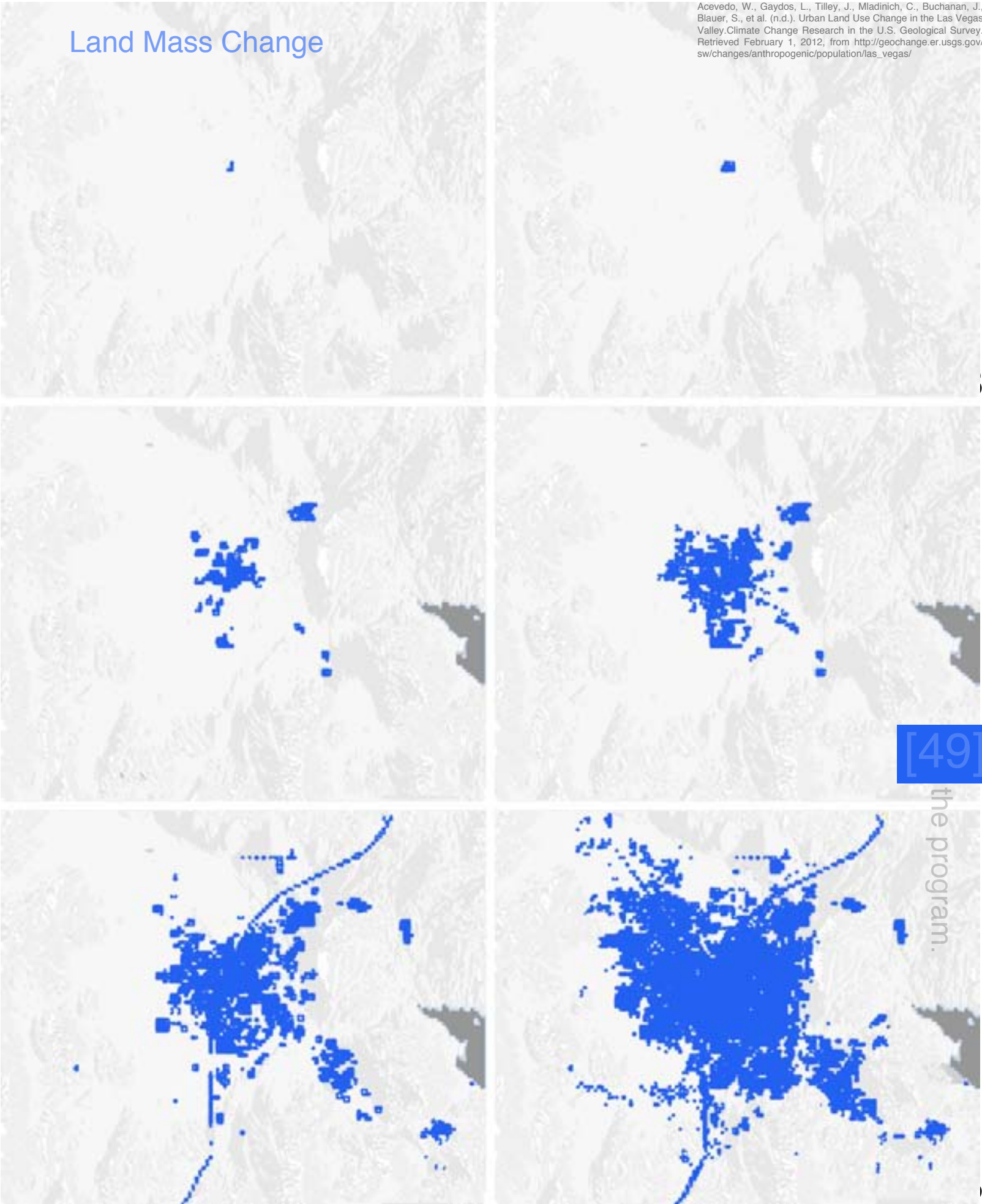
The 1960s brought massive change in Las Vegas. Howard Hughes led a phenomenon of massive hotel/casino buying and building. Corporations had the capital needed for such purchases and saw extreme profits (History, 2010). These hotels became the icon of Las Vegas that we see today.

An extreme population growth occurred in the mid-1980s. Las Vegas's population doubled between 1985 and 1995 . An increase from 186,380 people to 368,360 in ten years greatly contributed to the suburban landscape (History 2010). The 97.6 percent increase called for massive housing development. Today, we can see the sprawl of single family residential homes. What makes this situation unfortunate is the unsustainable fashion of this type of growth.

Las Vegas began as a city rich in perhaps the most valuable resource in the desert: water. The extremely rapid growth seen in the 1980's led to a massive strain on the supply. The growth has slowed, but the water is gone. The next challenge is finding a way to retrofit the city to survive long-term.

Land Mass Change

Acevedo, W., Gaydos, L., Tilley, J., Mladinich, C., Buchanan, J., Blauer, S., et al. (n.d.). Urban Land Use Change in the Las Vegas Valley. Climate Change Research in the U.S. Geological Survey. Retrieved February 1, 2012, from http://geochange.er.usgs.gov/sw/changes/anthropogenic/population/las_vegas/



Goals for the Project

Academic

The academic goals for this project call for innovation in not only design but also technique; the intent of this project is to motivate and inspire the academic community in a wide variety of ways. Advanced mapping techniques will help be used in analysis as well as design; these methods will ideally contribute to the academic world and progress representation techniques used at North Dakota State University and beyond.

Given that the location of North Dakota State University is Fargo, this project will provide a work of knowledge of ecological issues that extend past the Red River Valley region. A base of information about ecology and design in desert regions will contribute to the scope of education at NDSU.

Another academic goal of this project is contribute to the research of developmental trends in suburbia. With our nation continually urbanizing, this will become increasingly more relevant.

These goals will be realized through extensive research and graphic representations.

Research in augmented reality will help push the boundaries of both Landscape Architecture as well as the boundaries of the Landscape Architecture program at NDSU.

Professional

One professional goal is to produce a project that is well-rounded and well-developed so that it can be carried outside of the academic world and into the professional; ideally, work will be presented beyond this assignment as well. This will be realized in a variety of ways.

Another objective is to develop an ethical solution to the increasing problems of rapid urban development and sprawl; research in ecology and development will aid in progress toward this goal.

Finally, development of ecologically sensitive government policies will contribute to the professional world. Work on design parameters that are relevant to environmental issues will be fulfilled.

Personal

There are many personal goals for this project. An increase of knowledge of ecologically sensitive suburban design is important to this process.

Through research, I hope to better understand desert design and conditions; learning and distinguishing design in foreign climates will help my flexibility as a designer and future professional.

Another goal is my development of detailed work. I hope to increase my competence in this unique and important area of the design process.

The development of certain skills will be paramount to the design process as well. One major goal is to greatly improve my GIS and mapping skills; when used in tandem with research and planning, I hope to become an overall better designer who is more prepared for the professional world. With our world becoming increasingly digitized, it is important to stay advanced in GIS skills; the possibilities are endless.

The final goal is to increase my ability to work within tight parameters with many restrictions. With strict requirements in this process, this goal will be important to the completion of this project.



Site Analysis I Qualitative

A Narrative

The meandering, tight, yet wide streets of the Rhodes Ranch neighborhood weave in and out of the stucco factory. Somehow a neighborhood located on top of a beautiful golf course and on the side of a mountain has become a green/brown monotonous residential machine.

As my body exhales the heat of the day, moisture leaves my body never to be seen again. The extreme temperature is only offset by the minimal relief of the corporate plaster that comprises the homes in the neighborhood. Sun screen is a must!

Stunning views of the mountain ranges are dwarfed by the common, dull architecture. How can such a dramatic view be ignored by all these people? This area could possibly be one of the most striking settings I have ever experienced in my entire life, yet the stigma of “Sin City” is the only thing Las Vegas prides itself on. Surly the design of Rhodes Ranch can reflect the rich history of this desert and the people occupying it?



Christmas?

figure 31



Excuse me, can you move your truck?

figure 32

Exploring this neighborhood is like waking up with déjà vu everyday. As corners are turned and pavement is stomped, the feeling of repetition occurs. Fake green lawns are interrupted by brown plots of nothing. Is fake grass in front of a house the same as false lashes on a woman? It may look beautiful, but it's not the same person you fell asleep next to... This neighborhood needs some character, and beauty often comes from flaws.

As the streets wrap around the Rhodes Ranch Golf Course, nothing expresses the personalities of the people who live there. The development is far less than ideal. When a sedan can no longer fit in your driveway perhaps there is a problem in the design of the neighborhood. Is no one critical of the environment they surround themselves with? This may be the desert, but pride should be taken in the home; in the end it reflects a lifestyle.

The last question I ask myself when evaluating the Rhodes Ranch neighborhood is, "How can a street be so wide, yet offer no place to walk?" These short stumps called roads would be better used for a rat maze. A need for change is obvious.

Viewshed



views inward

views toward mountain range

figure 32

Two strong viewsheds exist, one toward the center of the neighborhood. The Rhodes Ranch Golf Course serves as the center node. All circulation and views wrap around this prominent feature. The second viewshed is to the west; the neighborhood sits at the base of the Spring Mountain range. Often views of this feature are trumped by the golf course.

General Development Layout



figure 33

Cul-de-sacs and dead-end drives create a dense, confusing grey network. Small lots combined with single family homes create narrow properties. The Rhodes Ranch neighborhood exemplifies typical “sprawl” development in an extreme fashion. five thousand homes fill the 1,000 acres of desert land.

Prominent Materials



Stucco

figure 34



Gravel and Concrete

figure 35



grass and water

figure 36

Stucco homes and concrete driveways are the prominent materials in the Rhodes Ranch neighborhood. Due to the arid climate of Las Vegas, very few plantings can be seen, with the exception of the golf course. There, an unusually green turf blankets the landscape.

Movement of Wind

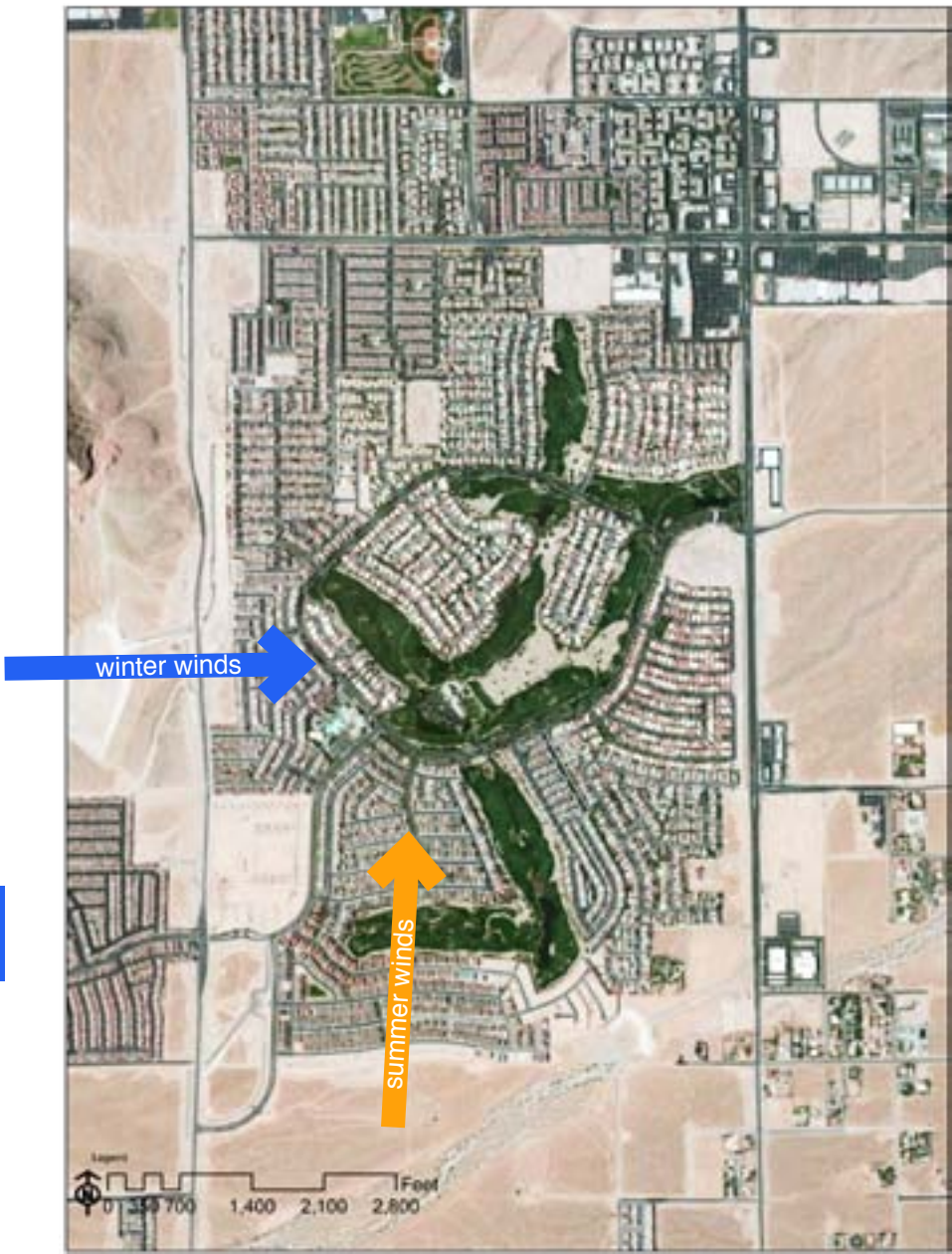


figure 32

Winter winds from the west are pushed off the mountain to the east of Rhodes Ranch. This can affect many microclimates within the site. Warmer summer winds from the south provide a much needed breeze during the hot summer months, when the temperature can reach over 100 degrees.

Site Analysis I Quantitative
Street Analysis

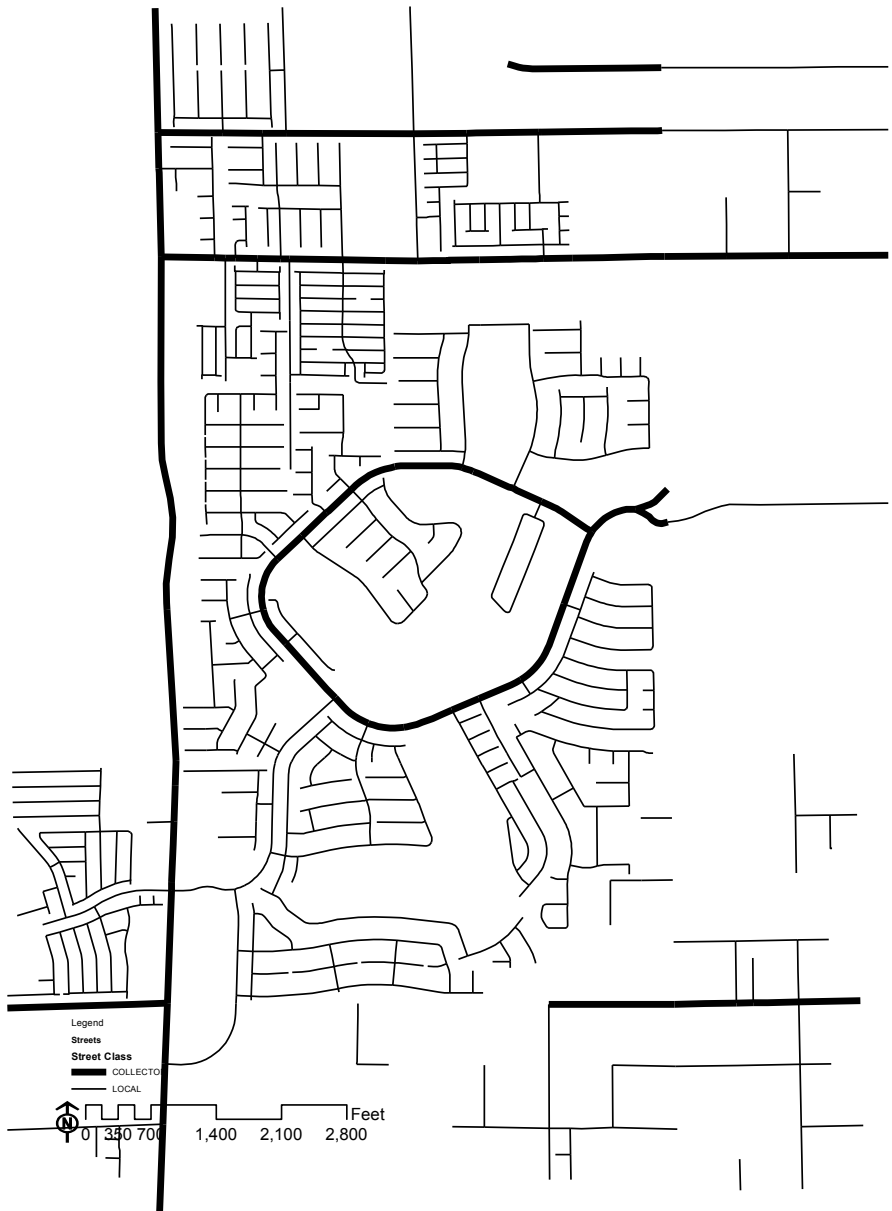


figure 37

Two types of streets exist on this site: collector and local. There are approximately 11 miles of collector streets and 57 miles of local streets. All of these roads are maintained by the city of Las Vegas.

Neighborhood Map

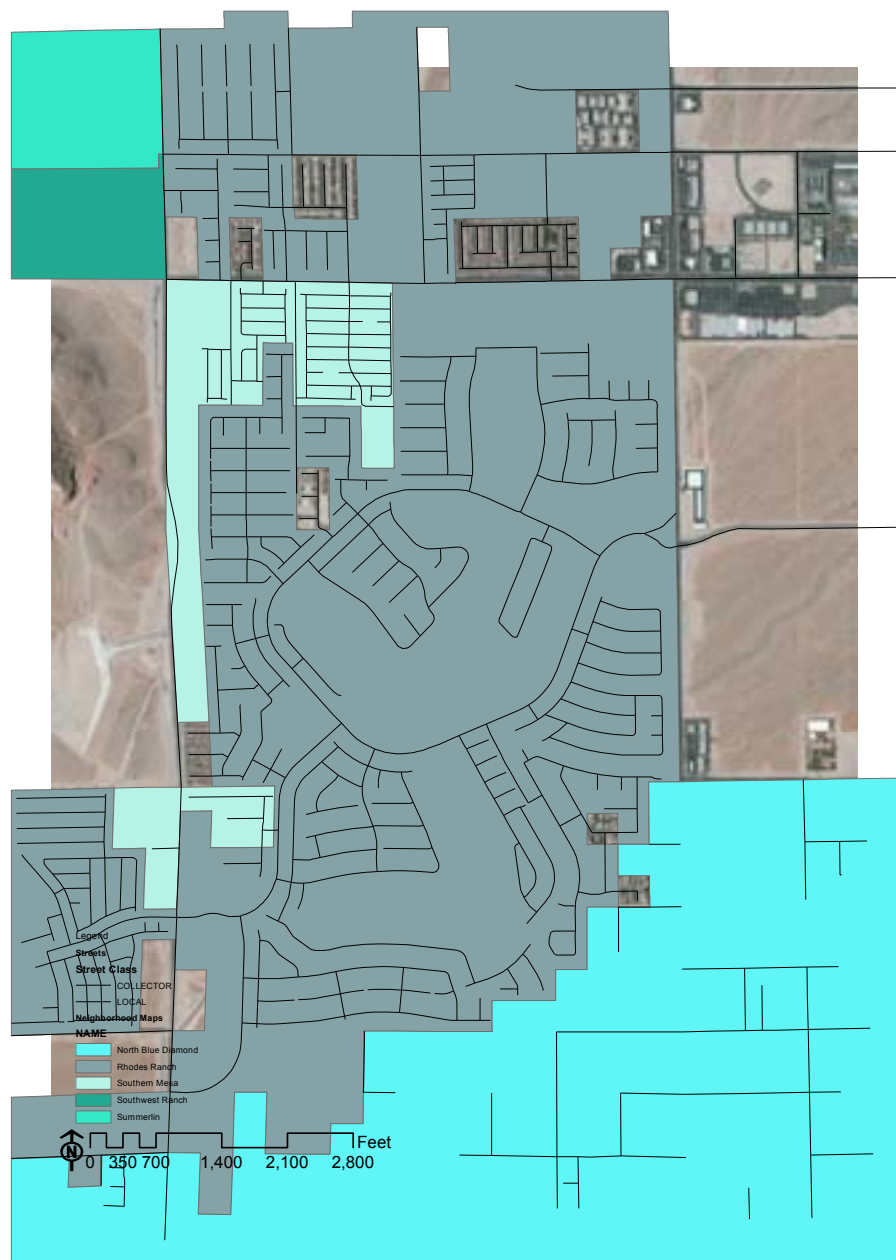


figure 38

The Rhodes Ranch neighborhood is parceled up but the edges are not well defined either. This map illustrates the political boundaries of neighborhoods in the area.

Topography

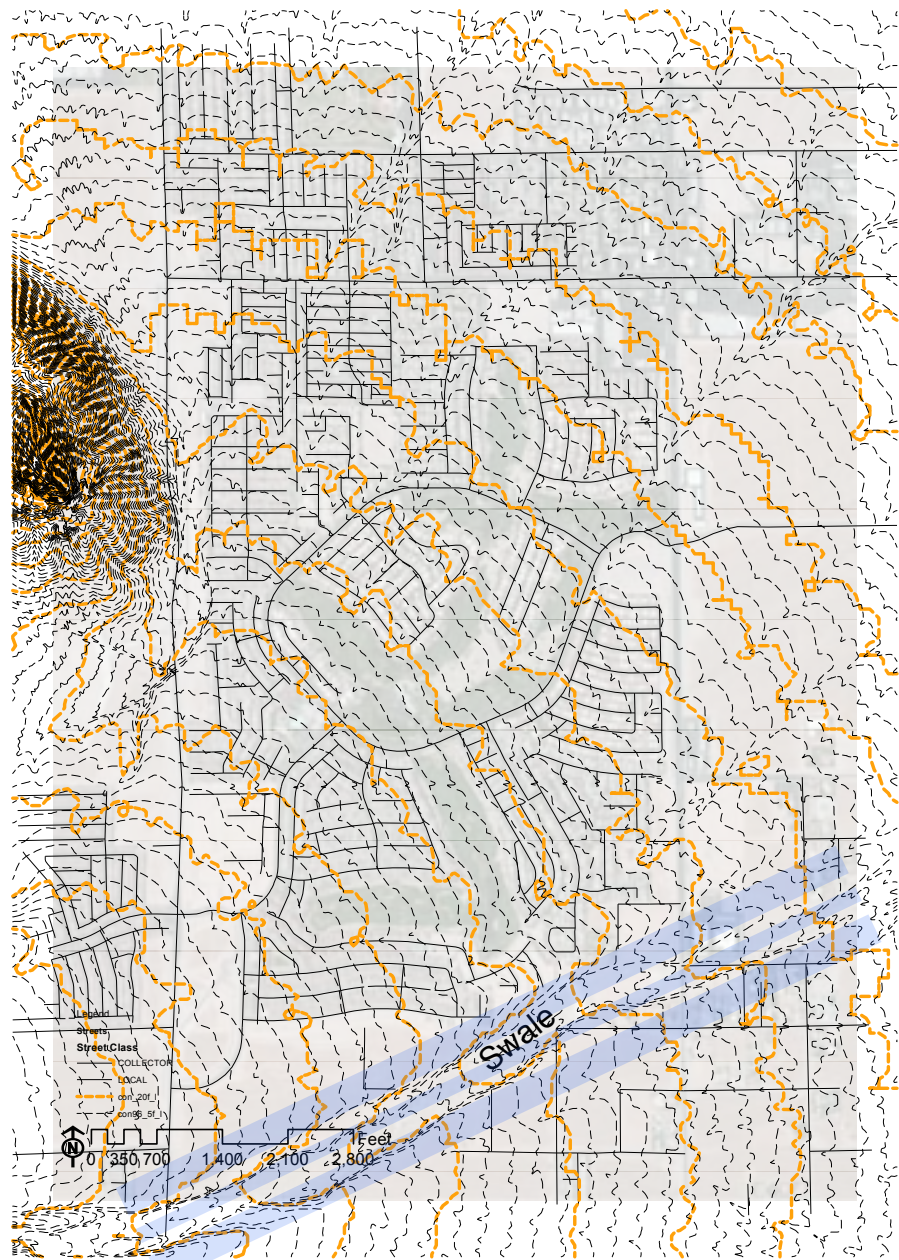


figure 39

The topographical analysis shows a large swale at the southern end of the site. This is a potential water transport area. The topography also expresses high slopes.

Soil Analysis

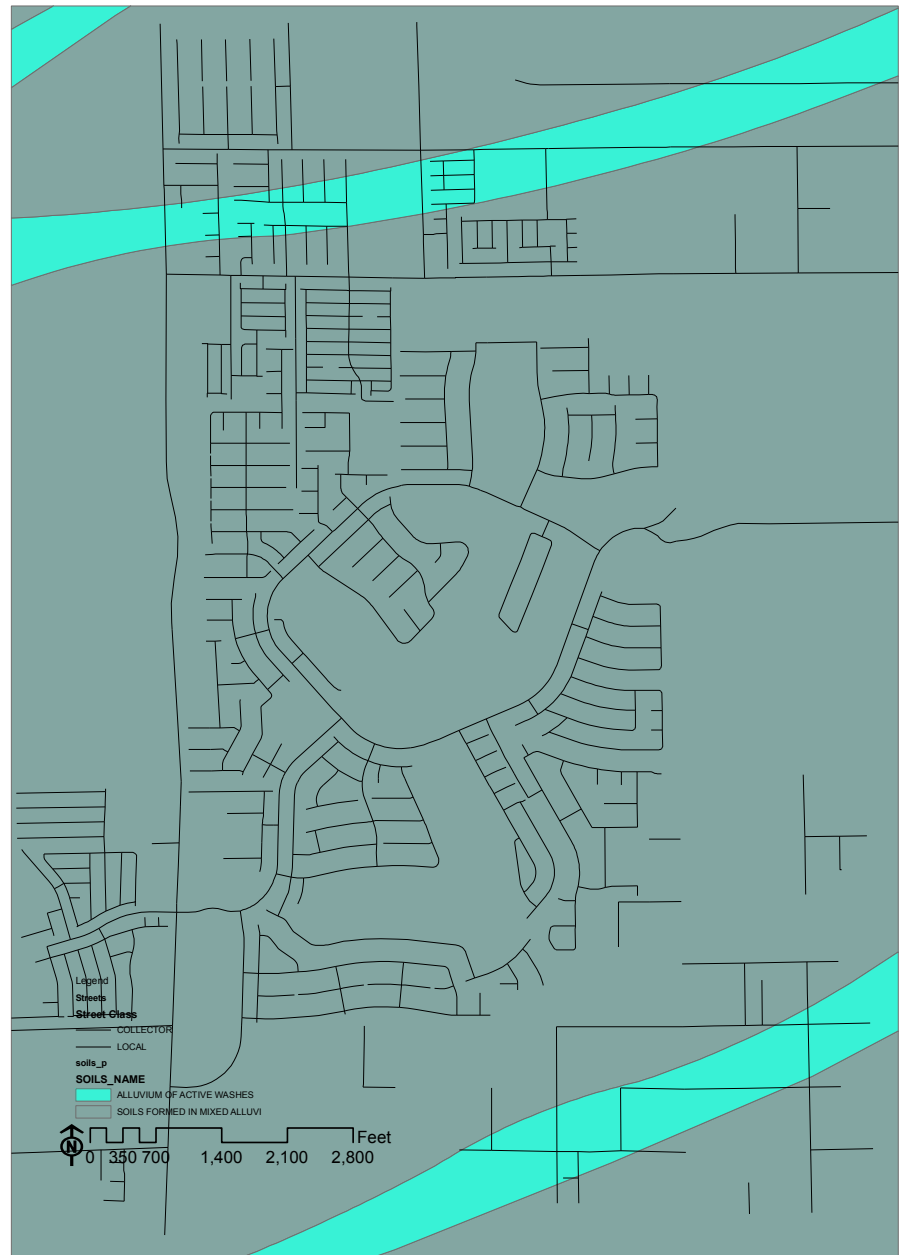


figure 40

Alluvial soil is formed by sediment transported by streams (Alluvial Soil, n.d.). This is vital information for the site. The rich alluvial soil in the ground explains the history of water throughout the site.

Watershed Districts

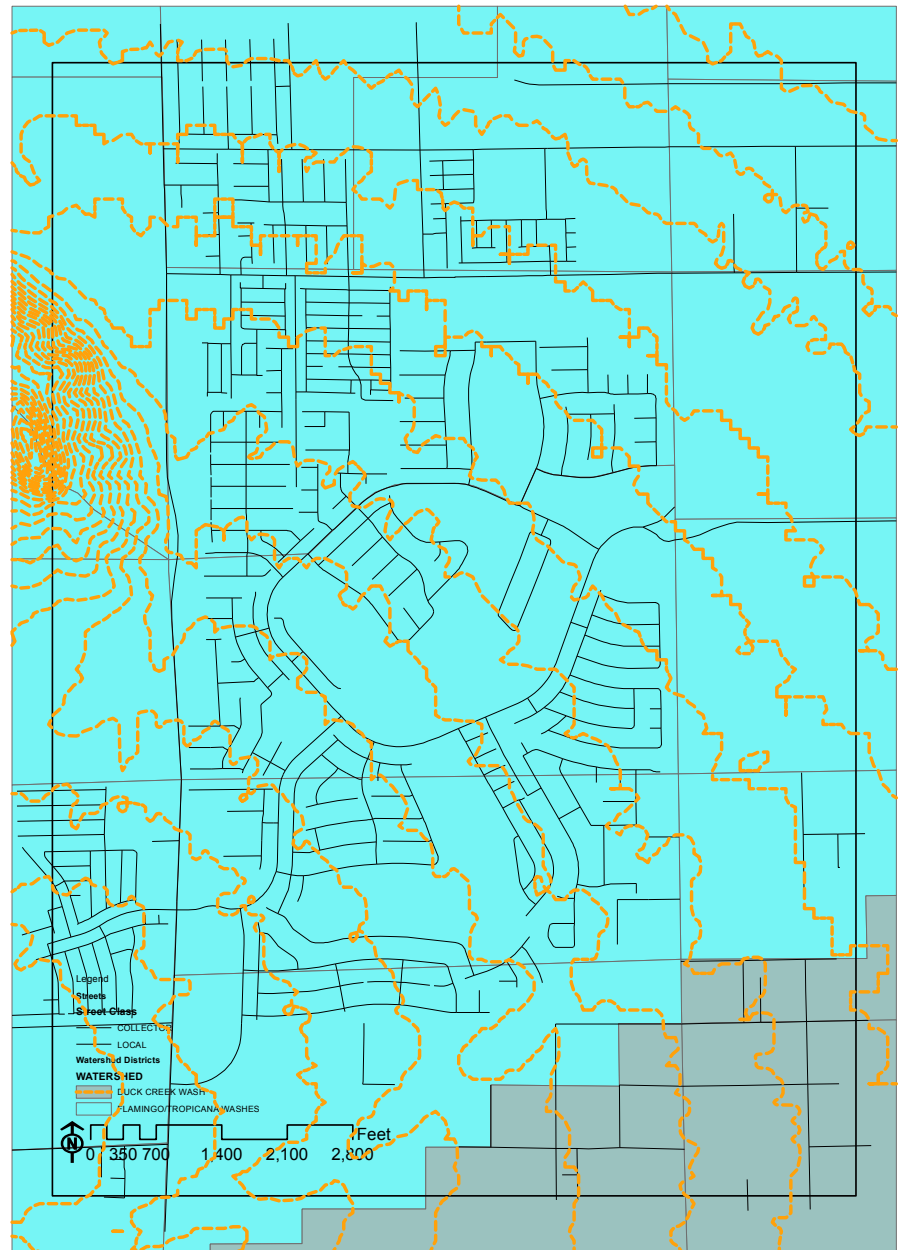


figure 41

The large swale south of the neighborhood is an edge of the watershed. The city of Las Vegas has sectioned off the district accordingly.

Emergency Dispatch Districts

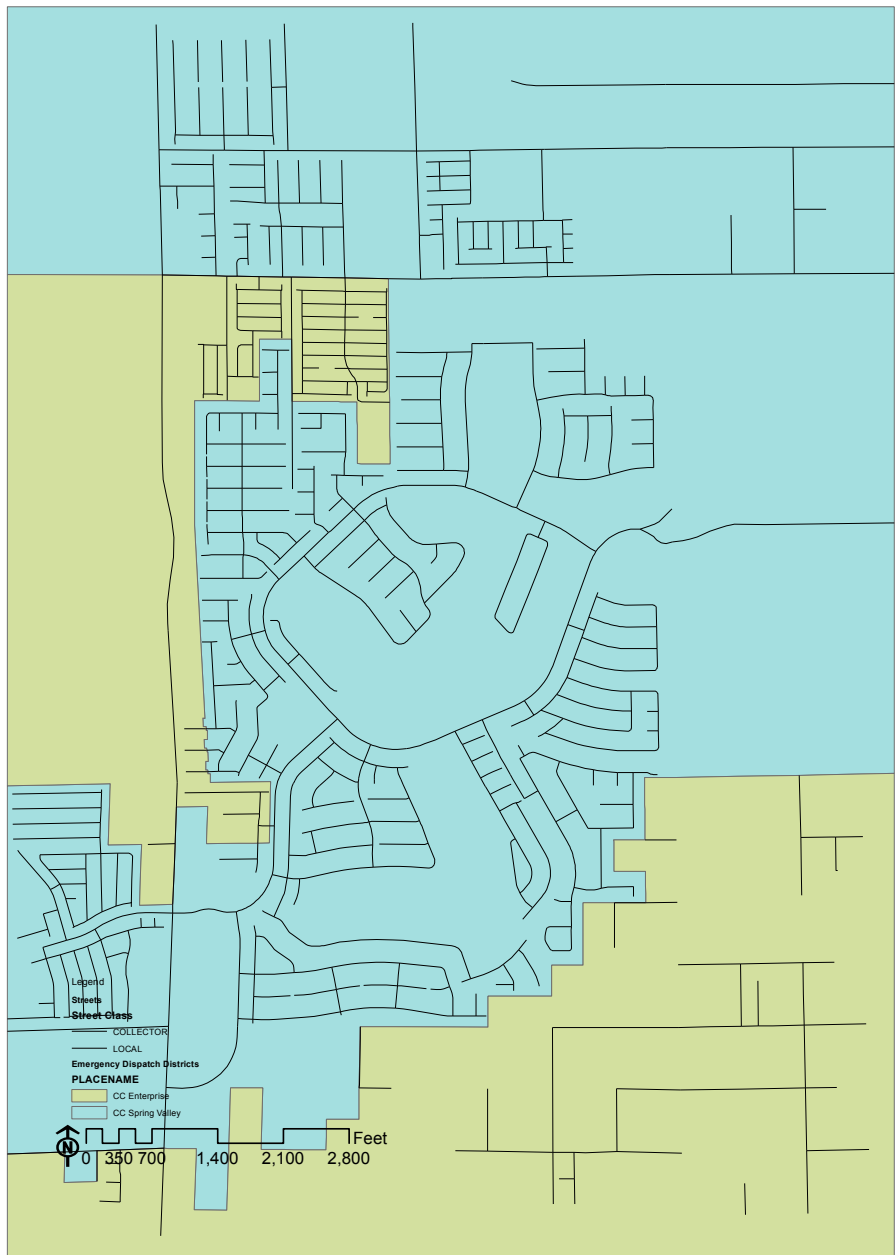


figure 42

The majority of the Rhodes Ranch Neighborhood is located in the same emergency dispatch district. This is important to the function of the site.

Schools



figure 43

One public elementary school exists at the North end of the site. The design should include children when possible.

Rhodes Ranch Golf Course



figure 44

The Rhodes Ranch Golf Course is a 162 acre 18-hole public golf course. The course also has many weddings and events. It costs \$59 per player to play 18 holes.

Wells



figure 45

All wells on site are still active. The most of the wells are located along the large swale.

Water Availability | Water Rights

| Allocation | Million Acre-Feet Per Year (MAFY) |
|------------------------|-----------------------------------|
| UPPER BASIN | |
| Colorado | 3.9 MAFY |
| Utah | 1.7 MAFY |
| Wyoming | 1 MAFY |
| New Mexico | 0.85 MAFY |
| LOWER BASIN | |
| Arizona | 2.85 MAFY |
| California | 4.4 MAFY |
| Nevada | 0.3 MAFY |
| ADDITIONAL ALLOCATIONS | |
| Mexico | 1.5 MAFY |
| TOTAL | 16.5 MAFY |

Colorado River. (n.d.). Southern Nevada Water Authority - Official Web Site. Retrieved February 7, 2012, from <http://www.snwa.com/ws/river.html>

Water rights in Las Vegas were established in 1932 when the population was approximately 2,300 people. With a metro population of nearly 2 million people, the city has reached its' water limit. According to the agreement, the entire state of NV is allocated .03 million acre-feet per year of water. This can supply about 300,000 people, leaving well over half the population without much needed water resources.

1 acre-foot = 325,851 gallons of water {enough to supply a family of 5 water for one year}

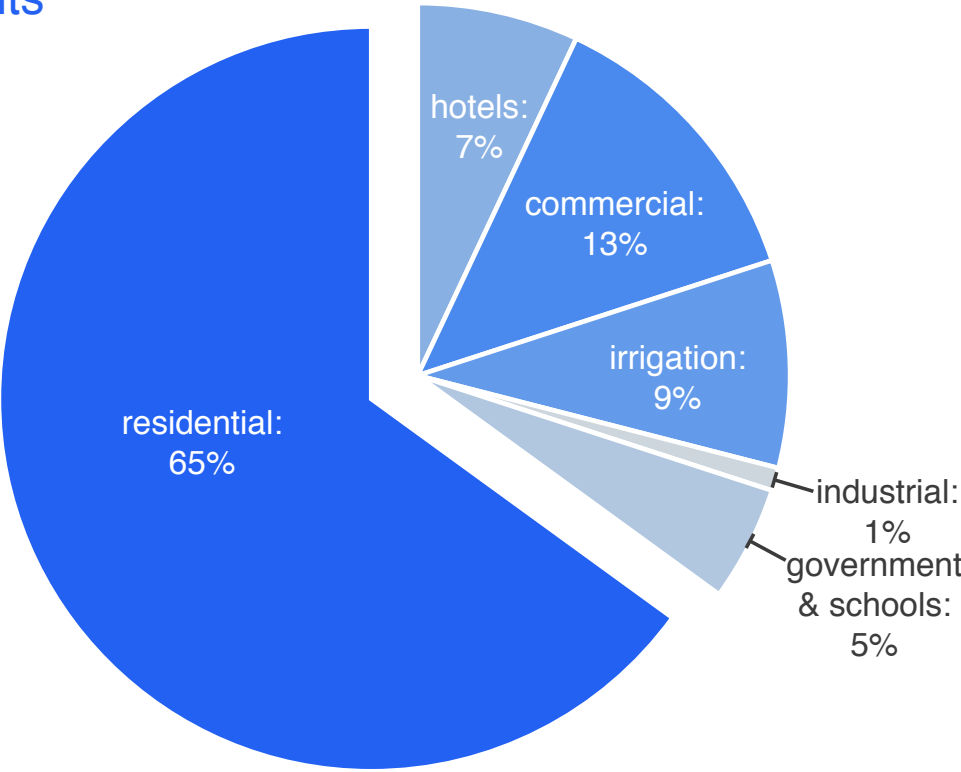
total water available supplies 60,000 households or 300,000 people

Water Usage | Water Rights

With residents accounting for 65% of total water usage, this has become not only an environmental problem, but also a social one.

While more rights to the Colorado River are not a plausible solution, new residential design is. Resurgent Ecologies proposes a possible reaction to these problems.

90% of water supplied to Las Vegas comes from the Colorado River



Colorado River. (n.d.). Southern Nevada Water Authority - Official Web Site. Retrieved February 7, 2012, from <http://www.snwa.com/ws/river.html>

Lake Mead Levels



acquired on August 22, 1985

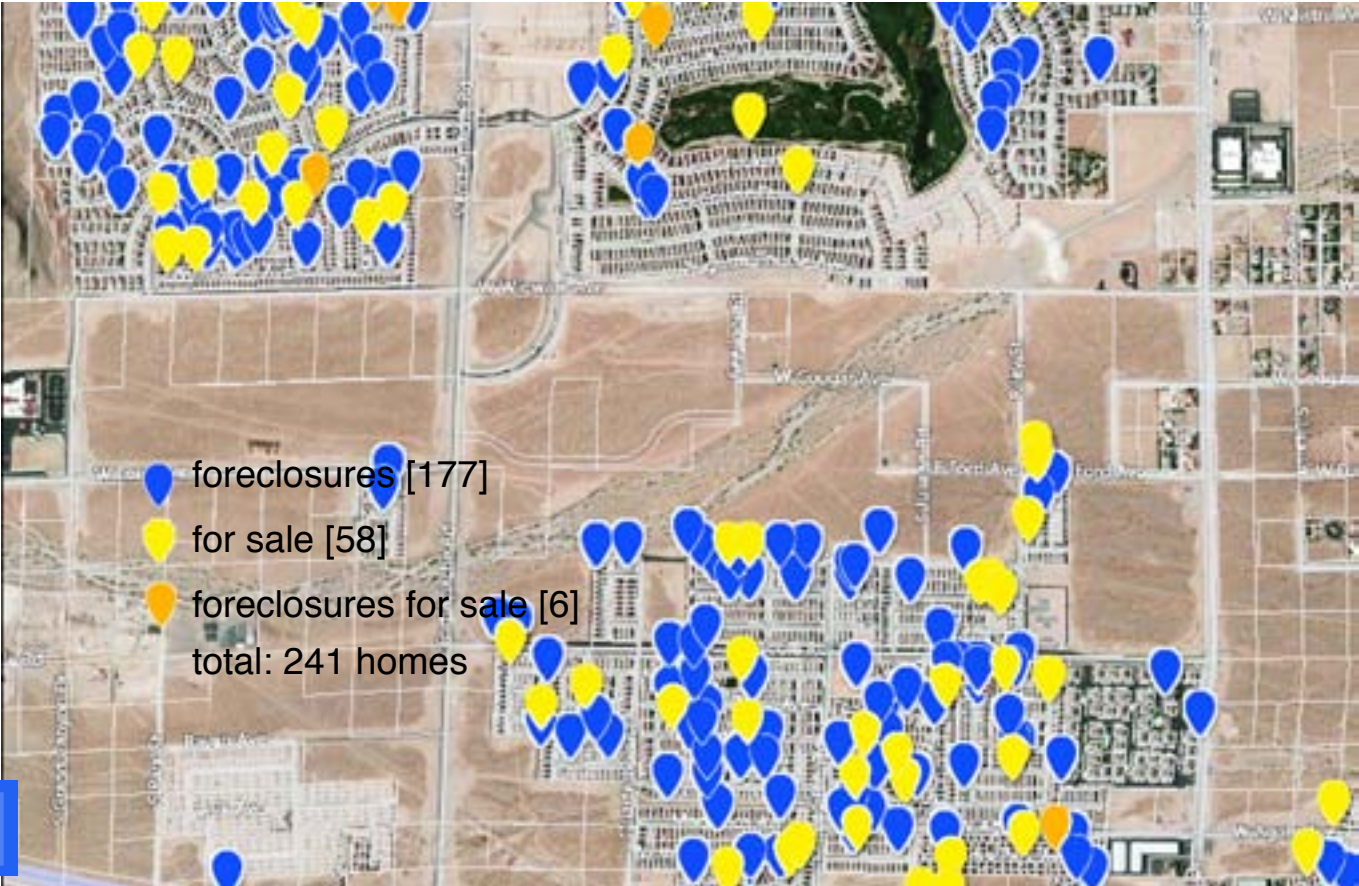
Water Level Changes in Lake Mead : Image of the Day. (n.d.). NASA Earth Observatory : Home. Retrieved February 6, 2012, from <http://earthobservatory.nasa.gov/IOTD/view.php?id=45945>



acquired on August 11, 2010

Water Level Changes in Lake Mead : Image of the Day. (n.d.). NASA Earth Observatory : Home. Retrieved February 6, 2012, from <http://earthobservatory.nasa.gov/IOTD/view.php?id=45945>

Foreclosures in Area



Clark County, Nevada - Government Services. (n.d.). HTML REDIRECT. Retrieved November 2, 2011, from <http://gisgate.co.clark.nv.us/gismo/Freedata.HTM>

There are at least 241 homes in foreclosure or for sale. This represents the extreme crash in land values in the area.

Typical homes in area



personal photo

Unsustainable Development



The aerial image above illustrates the unsustainable development and water use in the site. Although many homes are in foreclosure, the community continues to pour foundations for new development. The golf course is also an example of extreme water use in the desert environment.

[73]

the program.

Site Analysis I Climate Data

Average Temperatures

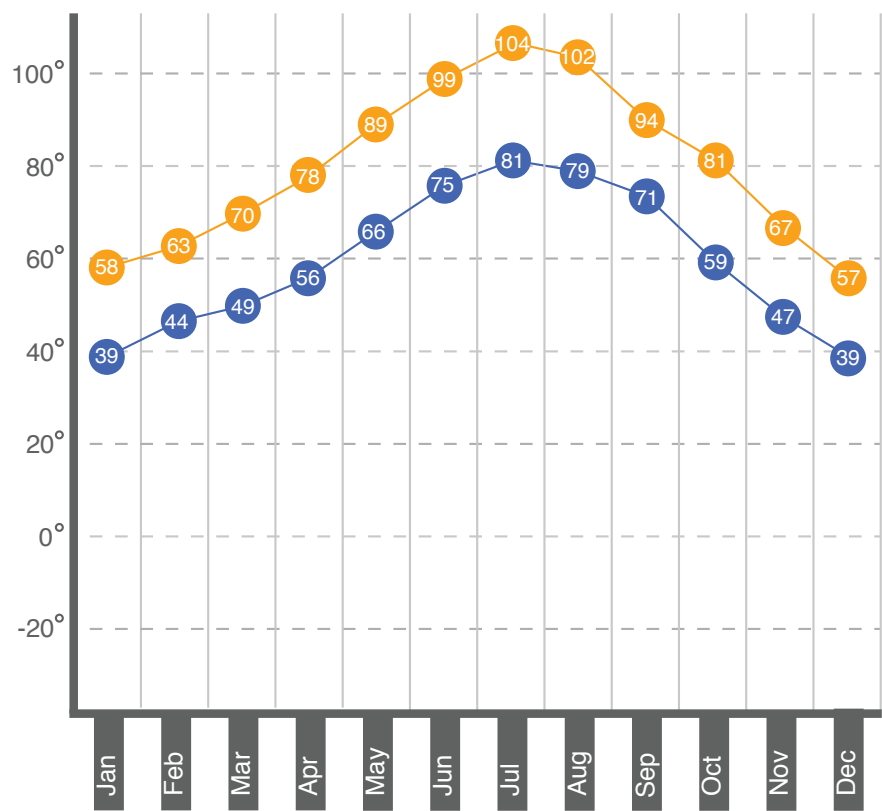


figure 46

Anual Percipitation

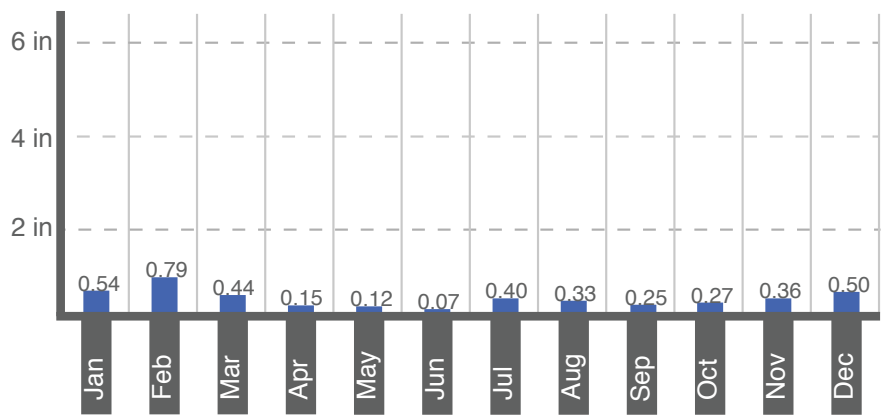


figure 47

Average Cloudy Days

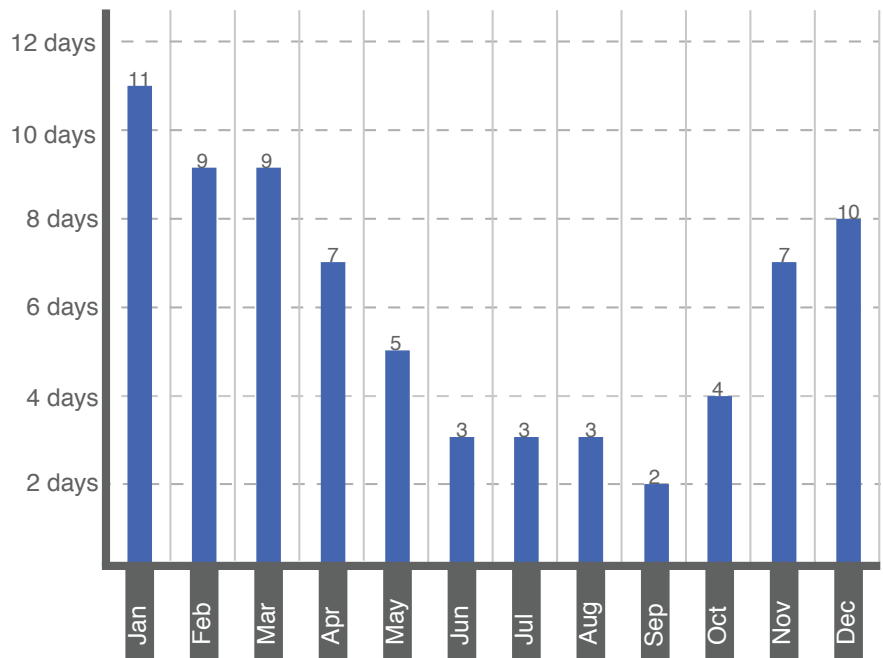


figure 48

Average Humidity

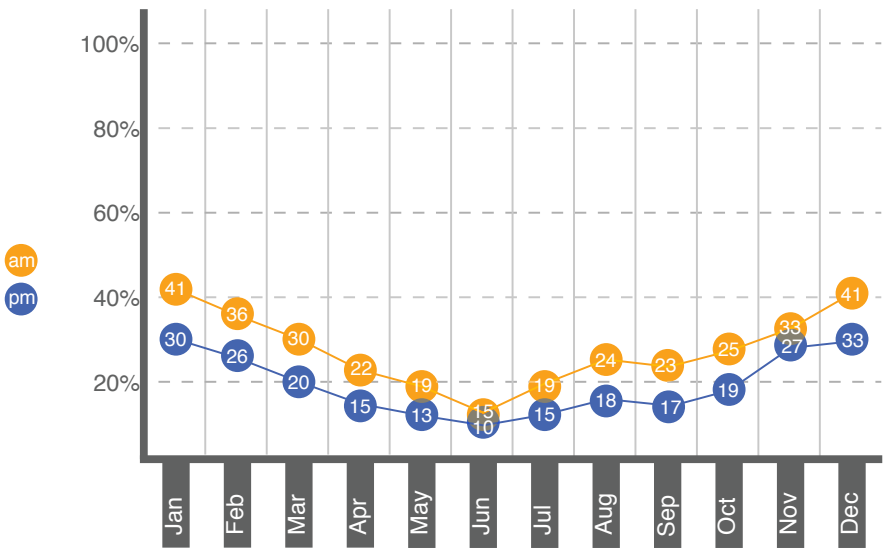


figure 49

Average Wind Speed

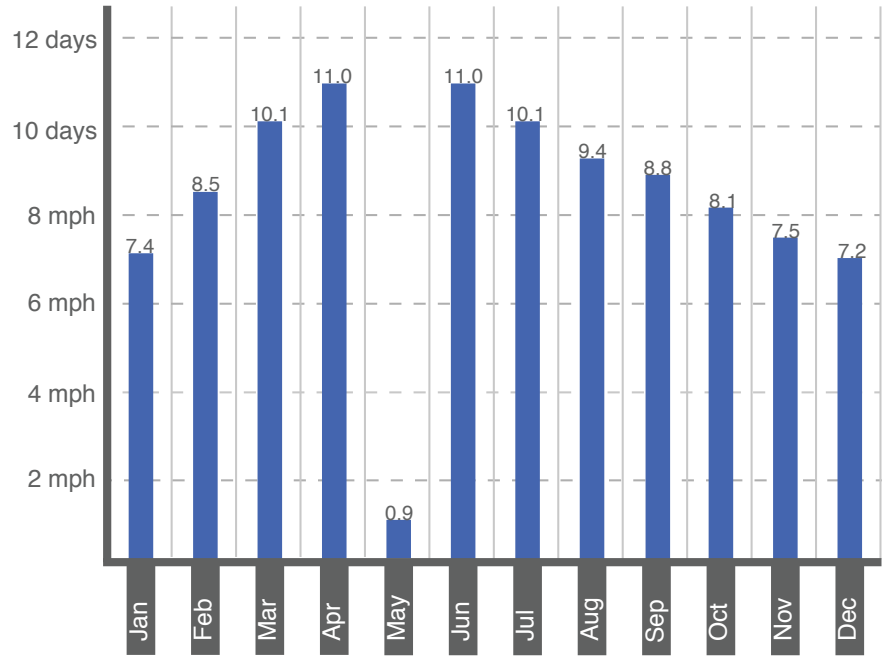


figure 50

Sun Patterns

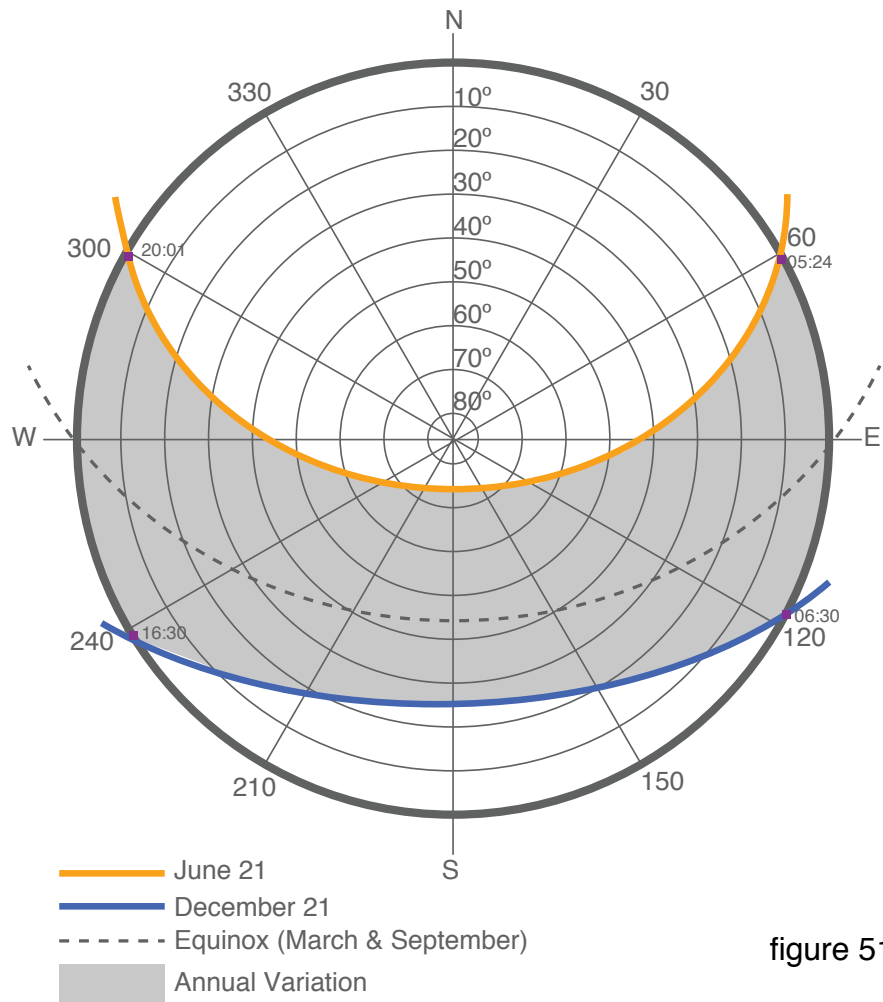


figure 51

the design.

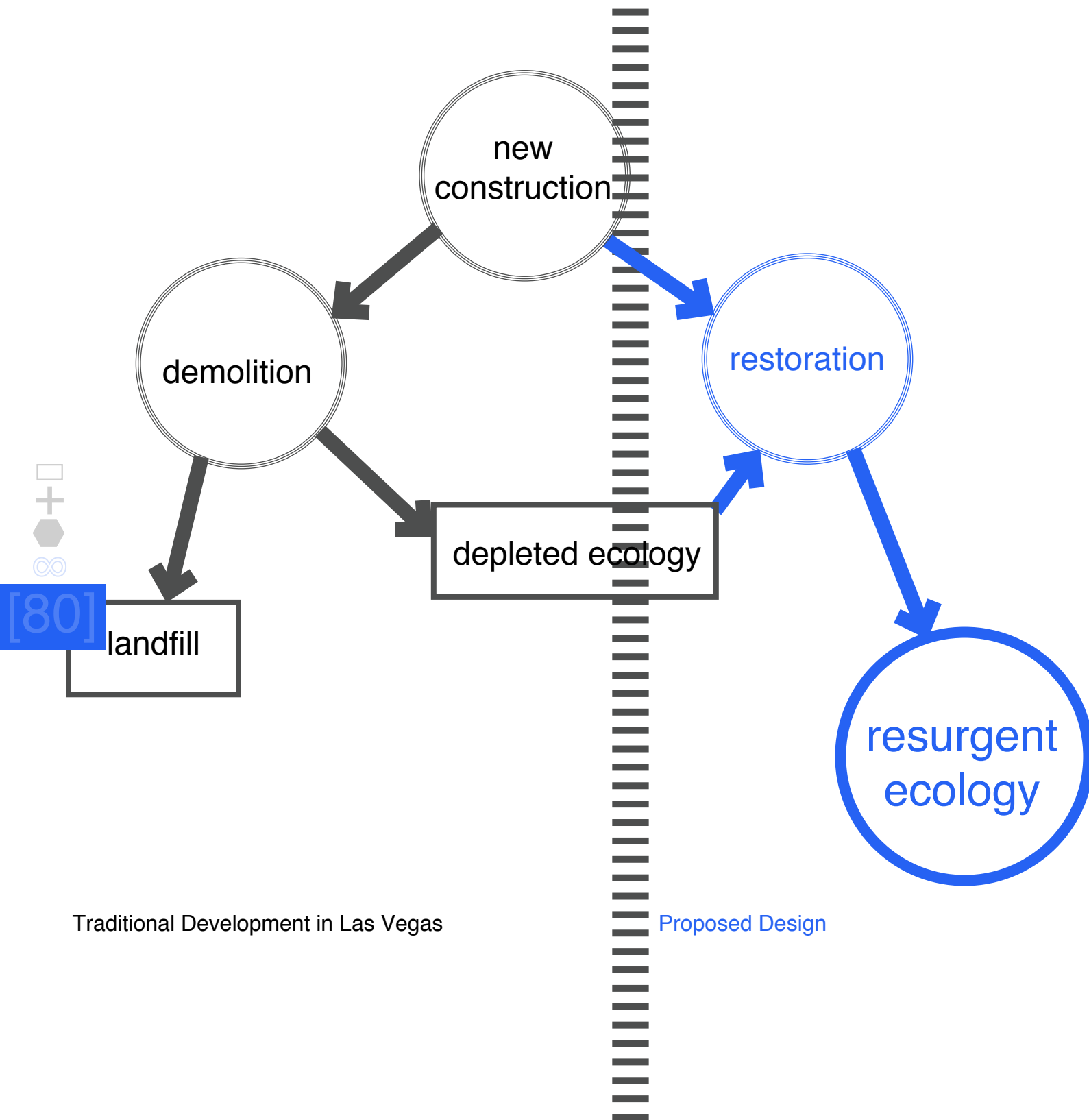
Programmatic Requirements

program → action items

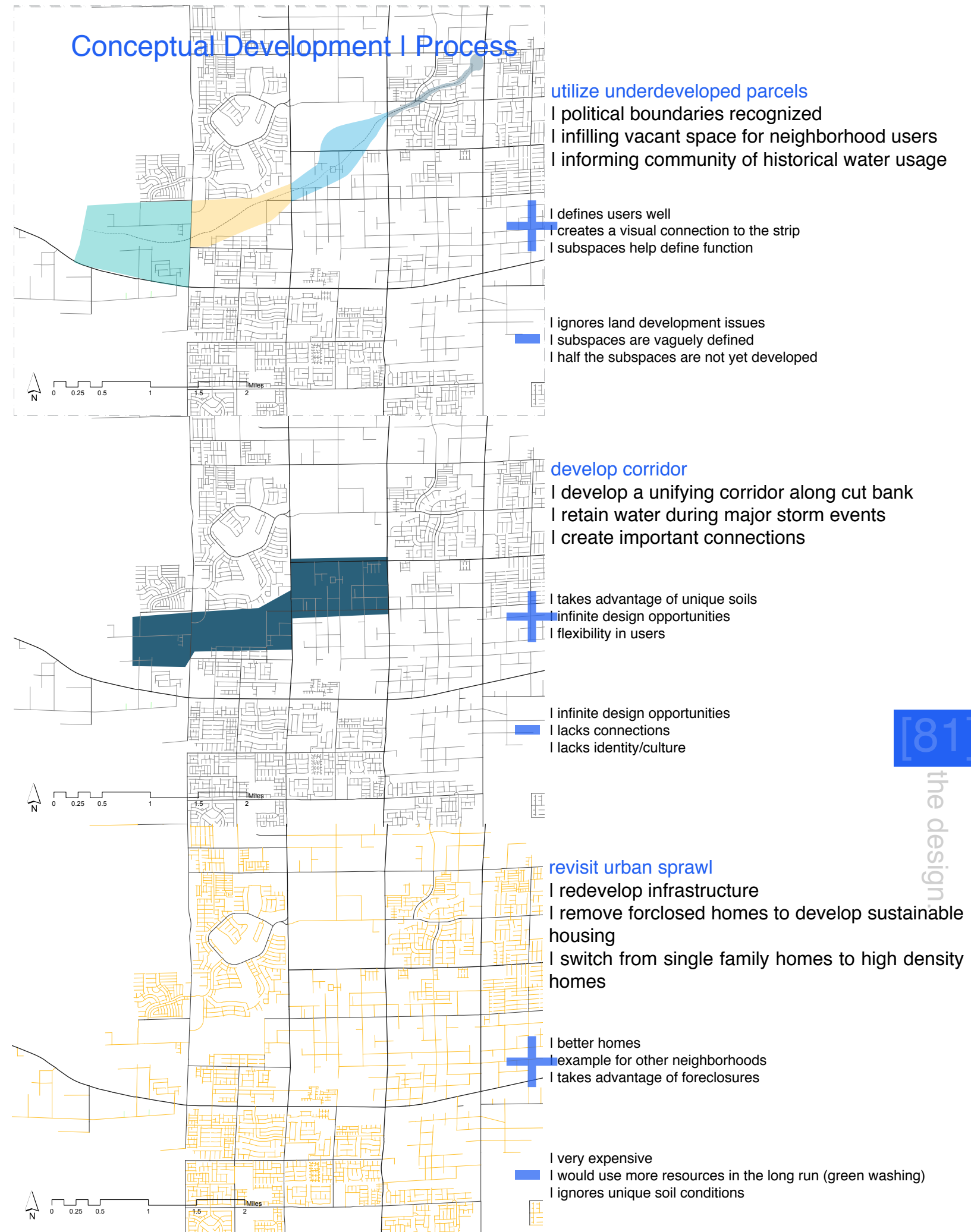
- Return on investment
 - _create an amenity for adjacent communities
 - _define a landscape that matures rather than depletes over time
- _ Connect the community to its roots in water
 - _informative landscape
 - _educate community of surrounding environment
- _inform residents about unique desert plants
 - _water retention for major storm events
 - _recharge aquifer where possible
 - _create ways to infiltrate the unique soil
- _create community connections
 - _wayfinding corridor that links multiple neighborhoods in SW Las Vegas
 - _develop unique subspaces within a greater corridor
- _leveraging social technology
 - _make Landscape Architects the leaders in social technology
 - _inform users of possibilities of site



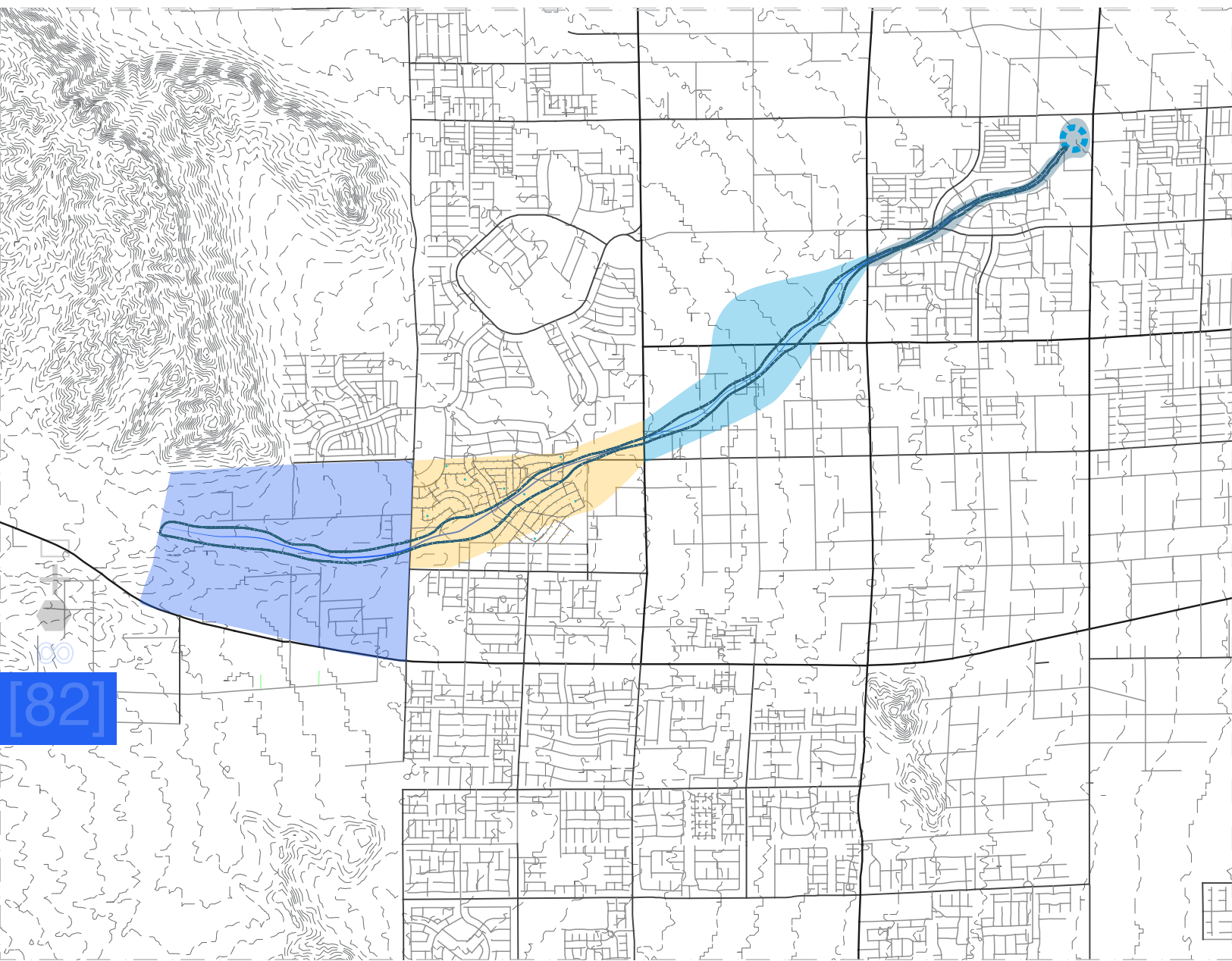
Conceptual Development I Mental Mapping



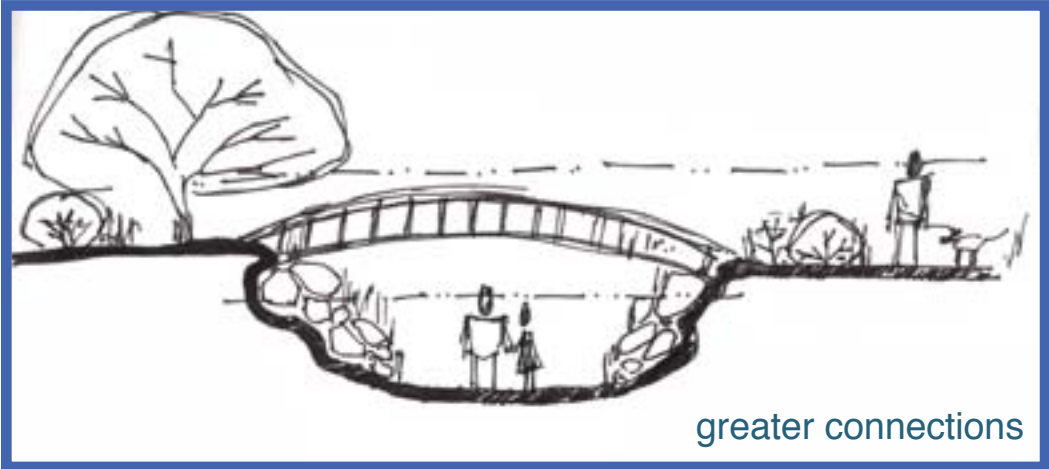
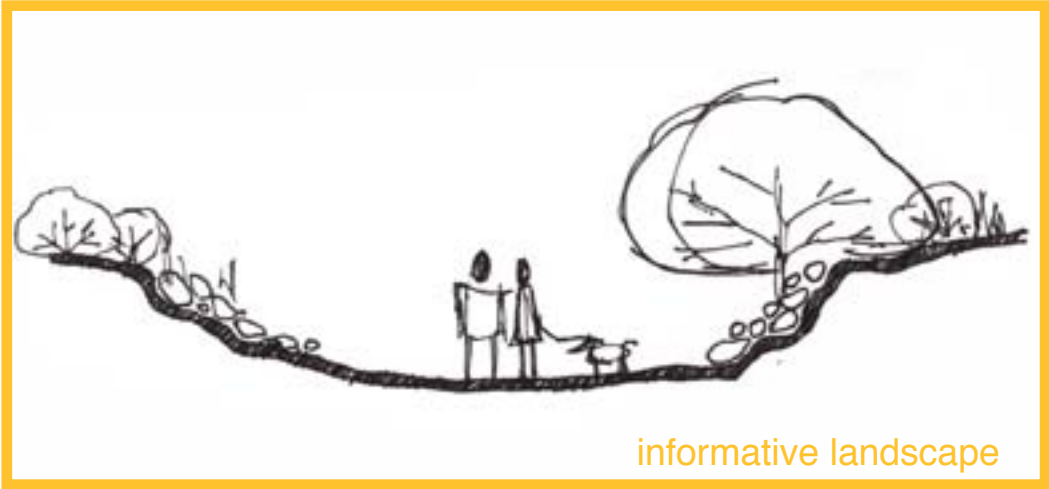
Conceptual Development I Process



Conceptual Development I Schematic Plan

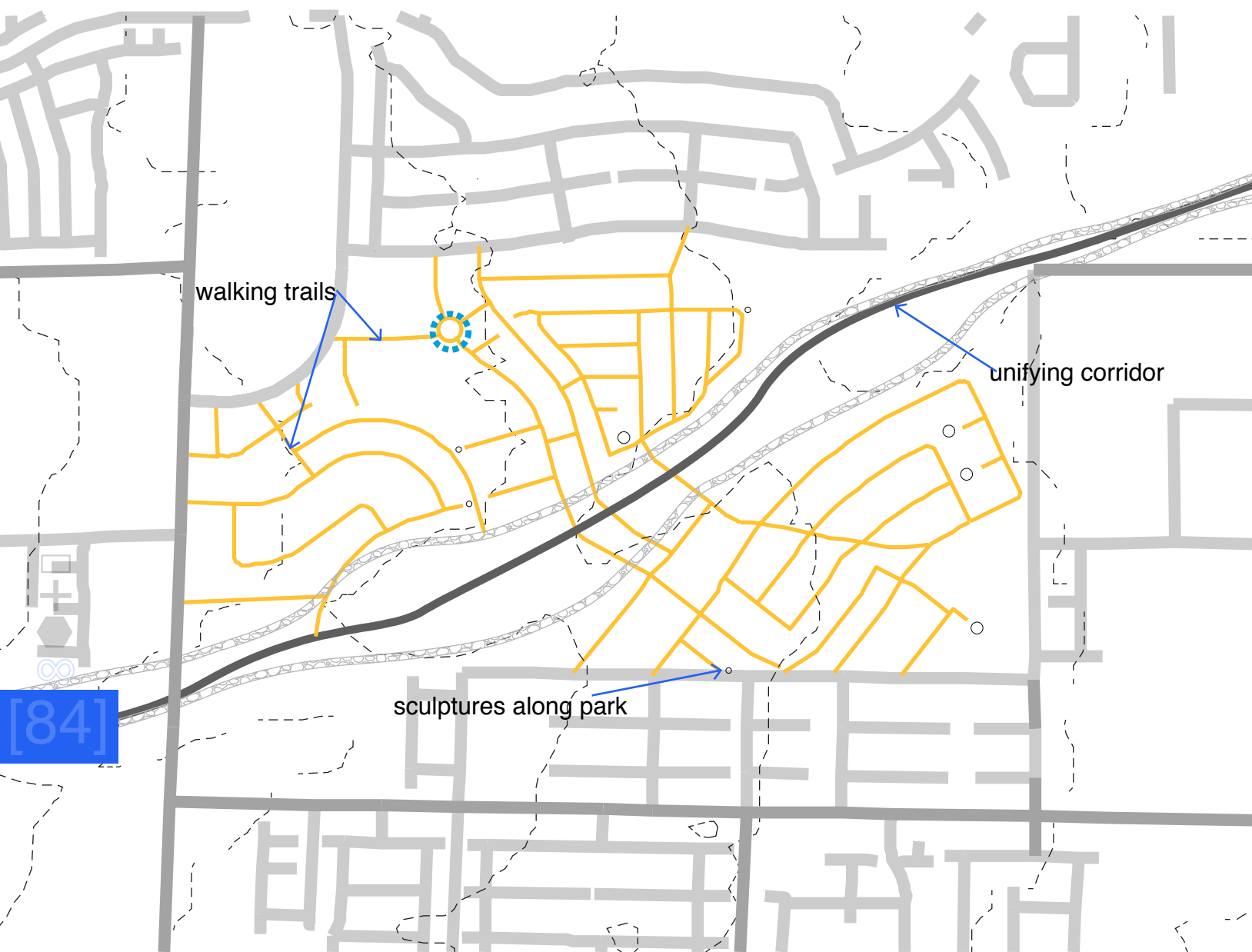


The main corridor was developed from the primary cut bank already displayed in the landscape. This creates a connection to three other neighborhoods. Each community can adopt a portion of this corridor and develop it as they see fit. For the purposes of this thesis, I continued the development process along the yellow section.



Detail Development | Sculpture Park

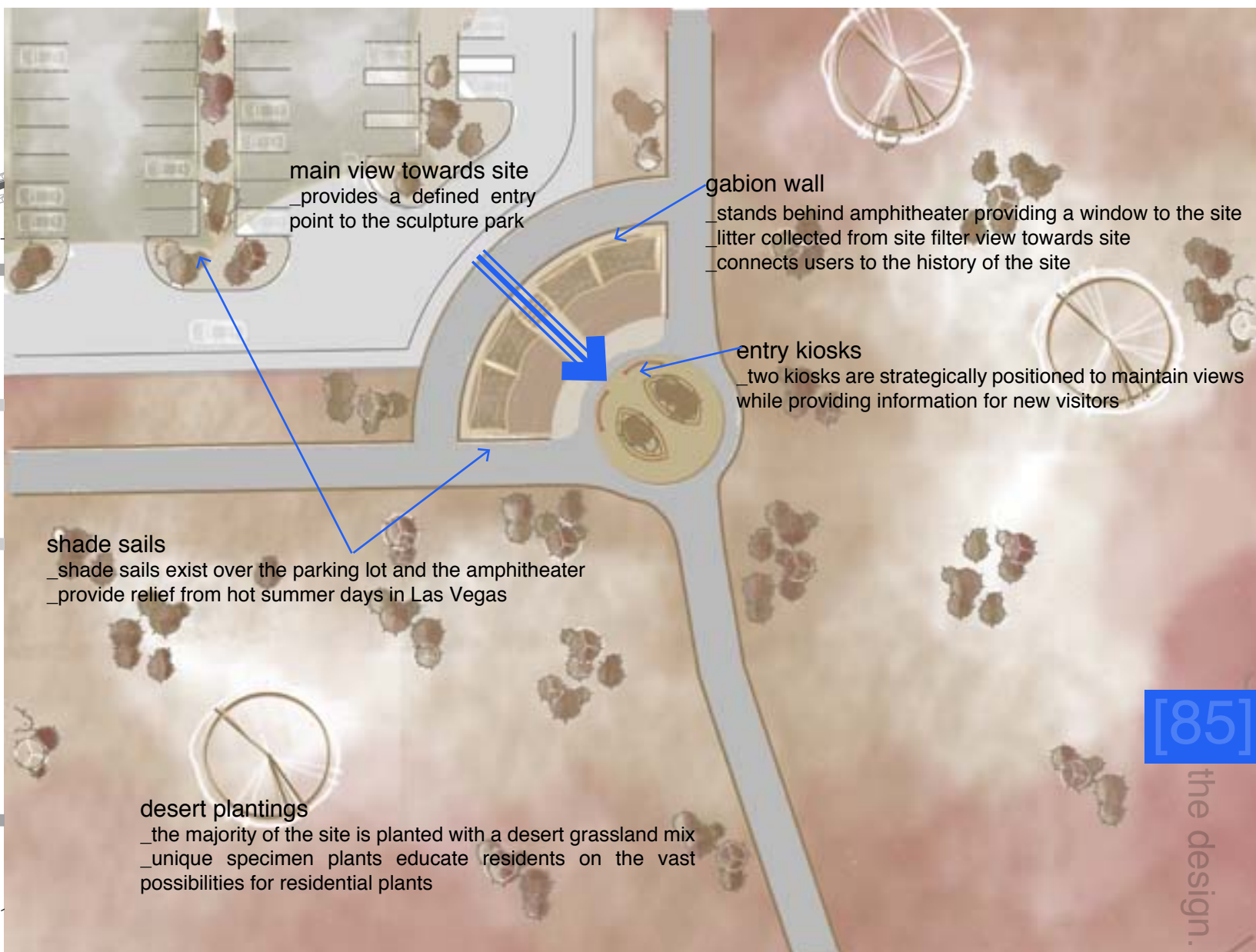
“What would happen if the human construct of suburbia were left to grow?”



The new sculpture park mimics the urban sprawl created by the community. The experience through the site informs users of both the history of unsustainable growth in Las Vegas, as well as, ways to move forward and help reclaim the ecology and the neighborhoods they live in.

The design of the walking trails is constructed from the layout of the suburban roads. Instead of homes along these paths, desert plantings take over the landscape. This represents the struggle between human construct and resurgent ecologies.

Detail Development | Trail Head



An amphitheater at the entrance of the sculpture park creates a gathering point for users. Long views of the park frame the new resurgent ecology.

Basic amenities such as shade sails and swales make the trail head a convenient place to rest and gather.

Detail Development | Trail Head



_litter from the site is encased in the gabion wall behind the amphitheater
_users must look through the scraps to see the new park
_shade sails provide a more comfortable environment
_amphitheater can be used as a resting place or as an educational opportunity for the nearby elementary school

Detail Development | Kiosks



Kiosks are constructed from recycled materials. As they are situated in the landscape, they slowly reveal more about the design as well as the environment around them.

Detail Development | Corridor Section



Reversing the development of Las Vegas

Currently the City Center boutique hotel in Las Vegas, NV, is now scheduled for demolition before any tourist has stepped foot in it. Quick and efficient construction on the building resulted in incorrect steel reinforcements and inevitably an uninhabitable building.

Unsustainable development of Las Vegas has severely stunted the natural ecology in this community and has contributed to a host of other natural disasters.

The rubble from the poorly constructed concrete and steel building can be used to rescue the damaged environment. Concrete scraps are set into the cut bank to help stabilize the highly erodible sand. Not only does the repurposed concrete retain earth, but it provides an opportunity to help hold plants in the cut bank. Live stakes also aid this process.

This new system creates a conceptual loop of the life and death of development in Las Vegas. Rather exploiting more resources for poorly constructed buildings, the community can take the large library of leftover construction materials to create a more livable and sustainable environment.

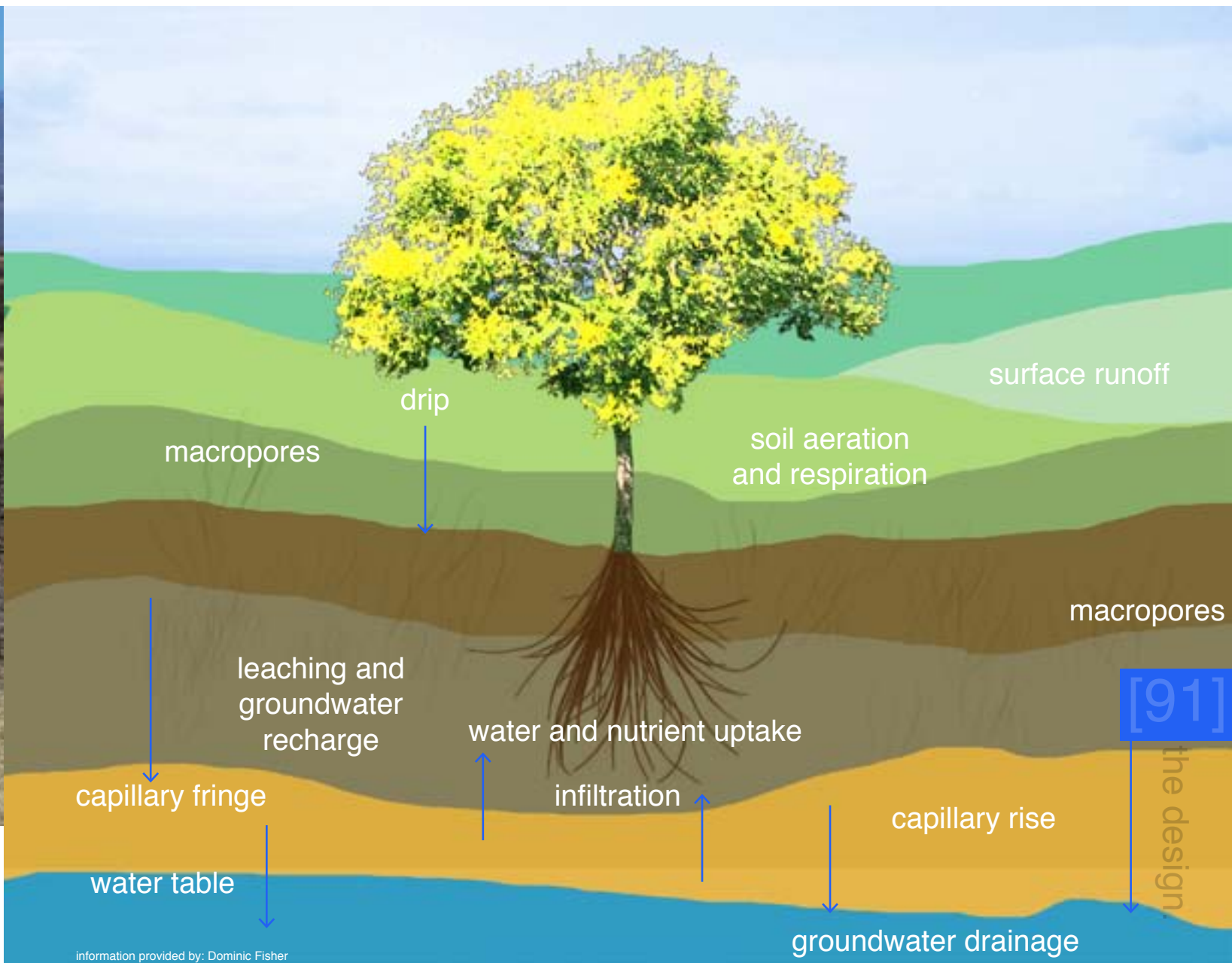
Detail Development | Desert Grassland



Desert grassland serves a crucial role in Resurgent Ecology. The plants help stabilize the soil and help infiltrate the groundwater. In certain areas where the water table is low, aquifers can be recharged by these plants

figure 52

Detail Development | Macropores



Desert grassland creates large root systems. As plants die, the roots leave macropores. These become tunnels for water to flow down during a storm event. It is a critical part of the resurgent ecology.

Detail Development | Plant Schedule

| Scientific Name | Common Name | Plant Characteristics | Height/Spread |
|---------------------------------|---------------------------|---|-------------------|
| Trees | | | |
| <i>Acacia cavenia</i> | Caven Acacia | showy yellow fragrant flowers | 15-20/15-20 |
| <i>Acacia franesiana</i> | Sweet Acacia | small tree screening attractive yellow bloom | 15-20/15-20 |
| <i>Acacai stenopylla</i> | Weeping Acacia | not thorny with white flowers | 15-20/15-50 |
| <i>Carnegiea gigantea</i> | Giant Saguaro | giant cactus edible red mellon-like fruit | to 50/10-12 |
| <i>Casuarina stricta</i> | Coast Beefwood | woody with cone-like fruits | 25-30/20-25 |
| <i>Cercidium floridum</i> | Blue Palo Verde | elegant tree blue-green foliage and bark | 15-30/15-30 |
| <i>Cercis canadensis</i> | Mexican Rosebud | pink to purple flowers that bloom before spring | 15-35/15-35 |
| <i>Dalea spinosa</i> | Smoke Tree | fragrant violet blue flowers | 10-20/10-20 |
| <i>Eucalyptus camaldulensis</i> | Red Gum | good tree for parks | 80-120/35-50 |
| <i>Fraxinus velutina</i> | Arizona Ash | good desert shade tree foliage turns yellow in fall | 30-45/30-35 |
| | | | |
| Shrubs | | | |
| <i>Arbronia sp.</i> | Sand Verbena | red, white, pink flowers from Feb-Sept | 4-24 in/8-24 in |
| <i>Agave americana</i> | Century Plant | bold blue-green leaves, large flower stalk when plant matures | 4-6/6-8 |
| <i>Agave dimoriana</i> | Octopus Agave | long slender twisting arms with no spines or barbs | 3-4/4-6 |
| <i>Antigonon leptopus</i> | Queen's Wreath Coral Vine | loves heat, small rose flowers midsummer to fall | to 40 ft vine |
| <i>Baccharis pilularis</i> | Dwarf Coyote Brush | good ground cover and bank cover | 6-10/6-10 |
| <i>Baileya multiradiata</i> | Desert Baileya | yellow blooms from March to May | to 12 in/to 18 in |
| <i>Beloperone californica</i> | Chuparosa | red tubular flowers from April to May, apted to rocky slopes, humming birds | 2-5/3-4 |
| <i>Caeslpiria gilliesii</i> | Yellow Bird of Paradise | Showy yellow flowers with long red stems that blooms from April to Sept | 6-10/6-8 |
| <i>Calliandra callifornica</i> | Fairy Duster Mesquitilla | Purplish red bloom throughout entire year | 2-3/2-4 |
| <i>Carpotus edulis</i> | Ice Plant | good bank stabalizer, purple flowers | 1-2 spreads |
| <i>Cissus trifoliata</i> | Arizona Grape Ivy | Blooms July-Aug | climbing vine |

figure 53



Blue Palo Verde



Smoke Tree



Coast Beefwood



Giant Saguaro



Sweet Acacia



Caven Acacia

figure 54

Leveraging Social Technology | Augmented Reality



As new technologies emerge, Landscape Architects should always be critical of the boundaries set in the profession. The image above illustrates how augmented reality can change the way participants of a site experience a design. With smart phones, users can scan a QR code and then reveal something about the landscape. The century plants is an example of how this can work.

Leveraging Social Technology | Augmented Reality

Proof of Concept



- Directions for using Augmented Reality:
- _download “juniao” app from app store
 - _scan QR code to the right
 - _load channel
 - _turn to pages for results



Leveraging Social Technology | Augmented Reality

Proof of Concept | Scan Here



Leveraging Social Technology | Augmented Reality

Hover over image for results



- Tips for viewing Augmented Reality:
- _Be sure to download “juanaio” app
 - _Put entire image (including border) in your phone
 - _Experiment with buttons in channel
 - _May require to be seen off a printed version of the images for best viewing 3D model of kiosk

Leveraging Social Technology | Augmented Reality

Hover over image for results



Reversing the development of Las Vegas

Currently the City Center boutique hotel in Las Vegas, NV, is now scheduled for demolition before any tourist has stepped foot in it. Quick and efficient construction on the building resulted in incorrect steel reinforcements and inevitably an uninhabitable building.

Unsustainable development of Las Vegas has severely stunted the natural ecology in this community and has contributed to a host of other natural disasters.

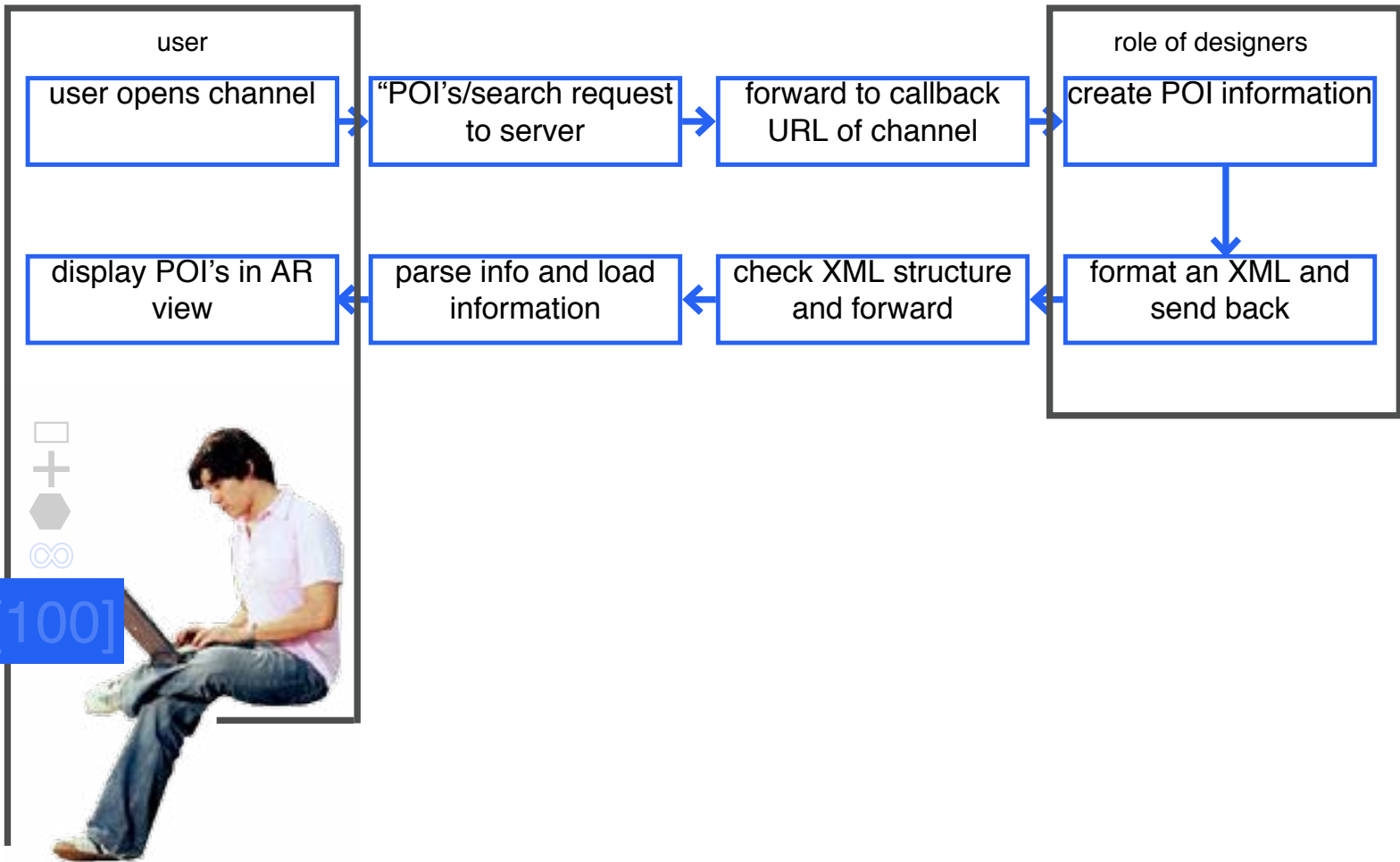
The rubble from the poorly constructed concrete and steel building can be used to rescue the damaged environment. Concrete scraps are set into the cut bank to help stabilize the highly erodible sand. Not only does the repurposed concrete retain earth, but it provides an opportunity to help hold plants in the cut bank. Live stakes also aid this process.

This new system creates a conceptual loop of the life and death of development in Las Vegas. Rather exploiting more resources for poorly constructed buildings, the community can take the large library of leftover construction materials to create a more livable and sustainable environment.

- Tips for viewing Augmented Reality:
- _Be sure to download “juanaio” app
 - _Put entire image (including border) in your phone
 - _Experiment with buttons in channel
 - _May require to be seen off a printed version of the images for best viewing 3D model of kiosk

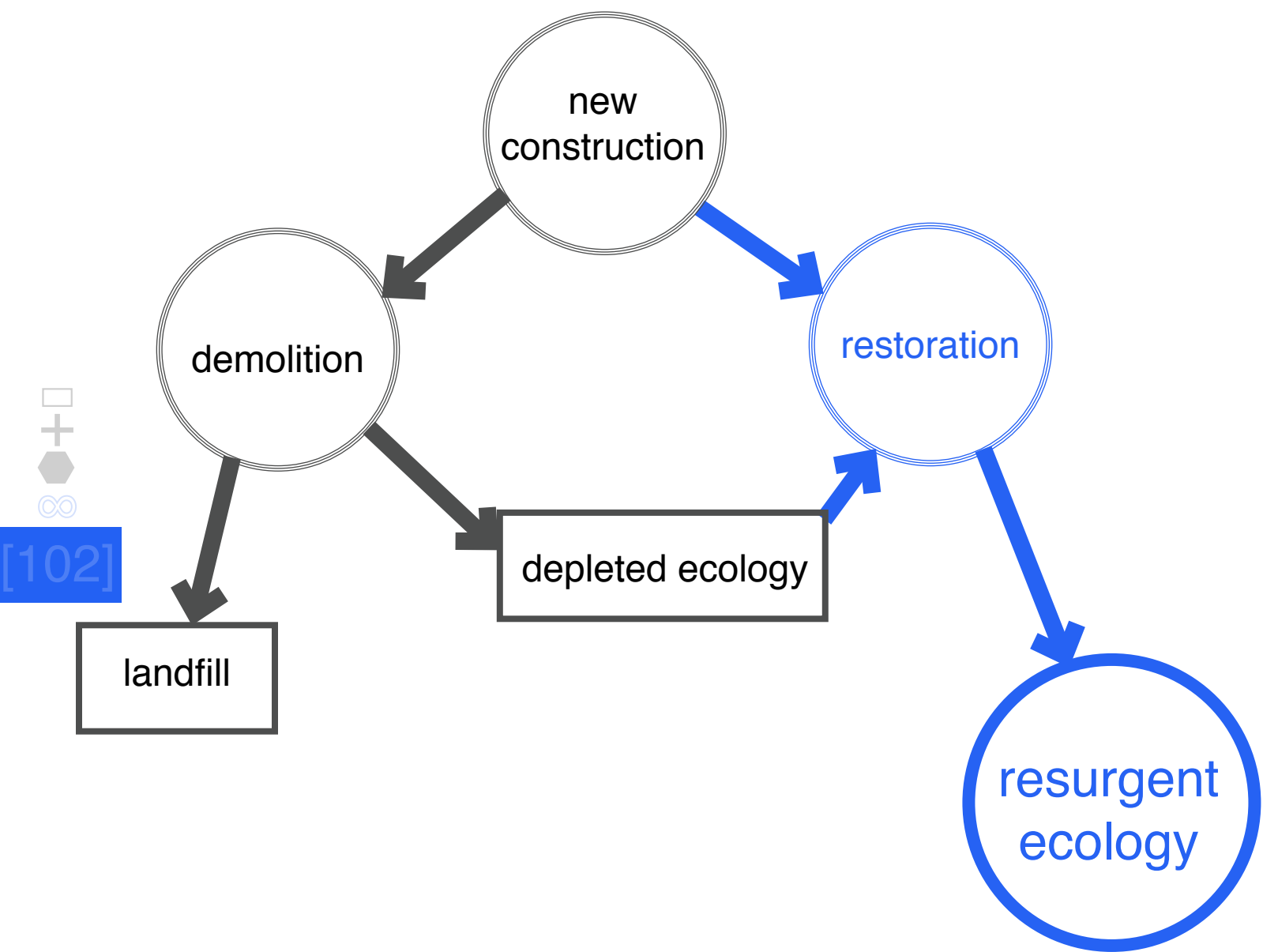
Leveraging Social Technology | Augmented Reality

What role do Landscape Architects play in technology?



Landscape Architects have become experts in creating the content for augmented reality. This project suggests that they also become the leaders in this technology. If designers can become masters of the center area, they can own this technology and use it to their advantage. Location based services are becoming increasingly accurate and Resurgent Ecologies proves this can work.

How can a community deprived of water become an urban hub of conservation?



Through unique plants, innovative design, and augmented reality, Resurgent Ecologies answers the question, “How can a community deprived of water become an urban hub of conservation?”

By evaluating current development trends in Las Vegas, Nevada, this project finds new ways to build with previously unsustainable materials in order to create a Resurgent Ecology.

Personal Identification

Samantha Lott

samanthajlott@gmail.com



“We have the power to define our own boundaries. Don’t let anyone make you think otherwise.”

Previous Studio Experience

2nd Year

| | |
|-------------------------------------|-----------------------|
| Fall Semester: | Kathleen Peppel 2008 |
| Tea House I Fargo, ND | |
| Rest Stop I Battle Lake, MN | |
| Spring Semester: | Mark Lindquist I 2009 |
| Cold Smoke I Fargo, ND | |
| River Corridor I Winnepeg, Manitoba | |
| River Walk I Fargo, ND | |

3rd Year

| | |
|-----------------------------------|------------------------|
| Fall Semester: | Stevie Famulari I 2009 |
| Environmental Artist | |
| Defiant Garden I Fargo, ND | |
| Regent Wildlife Path I Regent, ND | |
| Snow Sculpture | |
| Spring Semester: | Kathleen Peppel I 2010 |
| Personal Neighborhood | |
| Roosevelt Master Plan I Fargo, ND | |

4th Year

| | |
|------------------------------------|------------------------|
| Fall Semester: | Jay Kost I 2010 |
| Downtown Master Plan I Duluth, MN | |
| Cranberry Corridor I Duluth, MN | |
| Spring Semester: | Stevie Famulari I 2011 |
| Phytoremediation I Sioux Falls, SD | |

5th Year

| | |
|---|-----------------------|
| Fall Semester: | Dominic Fisher I 2011 |
| Red River Water Conservation I Red River Valley | |

Reference List (figures)

Figure 1: Las Vegas Suburbs. (n.d.).fotopedia. Retrieved September 22, 2011, from www.fotopedia.com/items/flickr-2870928217

Figure 2: Map of Nevada, retrieved on October 4, 201, from www.maps.google.com

Figure 3: Map of Nevada, retrieved on October 4, 201, from www.maps.google.com

Figure 4: Map of Nevada, retrieved on October 4, 201, from www.maps.google.com

Figure 5: Google Inc. (2009). Google Earth (Version 5.1.3533.1731) [Software]. Available from <http://www.google.com/earth/download/ge/>

Figure 6: Schaffer, D., & Vollmer, D. (2010). Pathways to urban sustainability: research and development on urban systems : summary of a workshop. Washington, D.C.: National Academies Press. Pg. 5

Figure 7: Lesson 1 - Federal Highway Administration University Course on Bicycle and Pedestrian Transportation, July 2006 - FHWA-HRT-05-085. (n.d.).Home I Federal Highway Administration. Retrieved December 7, 2011, from <http://www.fhwa.dot.gov/publications/research/safety/pedbike/05085/chapt1.cfm>

Figure 8: Rhodes Ranch Golf Course Las Vegas Rhodes Ranch Golf Club. (n.d.). Las Vegas Bachelor Bachelorette Party Packages Nightlife VIP Entertainment. Retrieved December 7, 2011, from <http://www.bachelorvegas.com/golfcourses/rhodes-ranch.html>

Figure 9: a weekly dose of architecture » Urban Reserve 22. (n.d.). Welcome to the World of Archidose!. Retrieved December 7, 2011, from <http://archidose.org/wp/2011/09/06/urban-reserve-22/>

Figures 10-12: Dillon, D. (2009, December). Unexpected in Dallas. Landscape Architecture, 99, 24-29.

Figure 13: HDR Photo of the Week: Chambers Bay Golf Course. (n.d.). HDR Photo of the Week. Retrieved December 7, 2011, from <http://hdrphotooftheweek.blogspot.com/2011/02/chambers-bay-golf-course.html>

Figure 14-18: Newcomb, T. (2009, December). Green Mine. Landscape Architecture, 99, 94-102.

Figure 19: File:Las Vegas Wash 1.jpg - Wikipedia, the free encyclopedia. (n.d.). Wikipedia, the free encyclopedia. Retrieved December 7, 2011, from http://en.wikipedia.org/wiki/File:Las_Vegas_Wash_1.jpg

Figures 20-22: Fred Phillips Consulting. (n.d.). Fred Phillips Consulting. Retrieved December 6, 2011, from http://www.fredphillipsconsulting.com/projects_lasvegas.htm

Figure 23: Lost City Nevada - Reconstruction Of Adobe Structures. (n.d.). Hotel Reservations - Last Minute Bookings - Discounted Rates. Retrieved December 5, 2011, from <http://www.sunsetcities.com/lostcity/lost-city-reconstruction.html>

Figures 24-30: Chung, S. K. (2002). Las Vegas then & now. San Diego, Calif.: Thunder Bay Press.

Figure 31-32: Google Earth Pro

Figures 33-43: Clark County, Nevada - Government Services. (n.d.). HTML REDIRECT. Retrieved November 2, 2011, from <http://gisgate.co.clark.nv.us/gismo/Freedata.HTM>

Figure 44: Hole by Hole Overview - Rhodes Ranch Golf Club. (n.d.). Vegas Golf - Rhodes Ranch Golf Club . Retrieved December 8, 2011, from <http://www.rhodesranchgolf.com/sites/courses/layout9.asp?id=613&page=33262>

Figure 45: Clark County, Nevada - Government Services. (n.d.). HTML REDIRECT. Retrieved November 2, 2011, from <http://gisgate.co.clark.nv.us/gismo/Freedata.HTM>

Figure 46-47: Weather Channel. (n.d.). The Weather Channel . The Weather Channel. Retrieved November 28, 2011, from <http://www.weather.com/weather/wxclimatology/monthly/graph/USNV0049>

Figure 48: Average Number of Cloudy Days - Western Regional Climate Center (WRCC). (n.d.). Western Regional Climate Center. Retrieved November 28, 2011, from <http://www.wrcc.dri.edu/htmlfiles/westcomp.ovc.html#NEVADA>

Figure 49: Weather Channel. (n.d.). The Weather Channel . The Weather Channel. Retrieved November 28, 2011, from <http://www.insidervlv.com/weather.html>

Figure 50: Average Number of Cloudy Days - Western Regional Climate Center (WRCC). (n.d.). Western Regional Climate Center. Retrieved November 28, 2011, from <http://www.wrcc.dri.edu/htmlfiles/westcomp.ovc.html#NEVADA>

Figure 51: Las Vegas, Nevada - Sunrise, sunset, dawn and dusk times for the whole year - Gaisma. (n.d.). Sunrise, sunset, dawn and dusk times around the World - Gaisma. Retrieved November 28, 2011, from <http://www.gaisma.com/en/location/las-vegas-nevada.html>

Figure 52: <http://www.panoramio.com/photo/52982198>

Figure 53: Miller, James D.. Design and the desert environment: landscape architecture and the American Southwest. Tucson: The University of Arizona, Office of Arid Land Studies, 1978. Print.

Figure 54: <http://www.pacificbulbsociety.org/pbswiki/index.php/ChilesFloweringDesert-2011TreesShrubsAndCacti>

<http://www.delange.org/AcaciaSweet/AcaciaSweet.htm>

<http://www.elginnursery.com/products.php?pid=53&detail=true>

<http://home-and-gardening.info/2010/11/29/giant-saguaro-cactus/>

<http://www.flickr.com/photos/adaduitokla/6103682334/>

<http://desertcrestpress.com/xeriscaping-landscaping-design-in-arizona-for-color/>

http://www.dirtdoctor.com/Redbud_vq833.htm

<http://davesgarden.com/guides/pf/showimage/249241/#b>

<http://www.art.com/products/p13028215-sa-i2272799/neale-cl Clarke-red-river-gum-tree-eucalyptus-camaldulensis-wilpena-flinders-ranges-south-australia-australia.htm>

<http://desertedge.blogspot.com/2010/06/project-site-creosote-to-aspens.html>

Alluvial Soil . (n.d.). Engineering Training and Reference Manuals. Retrieved December 8, 2011, from http://engineeringtraining.tpub.com/14069/css/14069_516.htm

Berger, A. L. (2006). *Drosscape*. New York: Princeton Architectural Press.

Berns, D. (2011, March 31). Numbers reveal mixed picture on Las Vegas economy - Thursday, March 31, 2011 | 12:55 p.m. - Las Vegas Sun. *Las Vegas Sun*. Retrieved October 4, 2011, from <http://www.lasvegassun.com/news/2011/mar/31/numbers-reveal-mixed-picture-las-vegas-economy/>

Chung, S. K. (2002). *Las Vegas then & now*. San Diego, Calif.: Thunder Bay Press.

Coolican, P. (2011, November 30). In wake of real estate collapse, crazy deals abound. Las Vegas Sun. Retrieved November 30, 2011, from <http://www.lasvegassun.com/news/2011/nov/30/wake-real-estate-collapse-crazy-deals-abound/>

Dillon, D. (2009, December). Unexpected in Dallas. *Landscape Architecture*, 99, 24-29.

EVANS, K. (n.d.). The First 100 Persons Who Shaped Southern Nevada. The First 100 Persons Who Shaped Southern Nevada. Retrieved December 5, 2011, from <http://www.1st100.com/part3/hughes.html>

Fred Phillips Consulting. (n.d.). Fred Phillips Consulting. Retrieved December 6, 2011, from http://www.fredphillipsconsulting.com/projects_lasvegas.htm

G. Weaver Hipps Elementary School | Portfolio RWA, Inc.. (n.d.). Civil Engineering - Land Planning - Surveying and Mapping - Landscape Architecture RWA, Inc.. Retrieved November 28, 2011, from <http://www.consult-rwa.com/photogallery/default.aspx?contentid=250>

Green, E., Wise, Z., & Sweet, P. (n.d.). For Want of Water - Topics - Las Vegas Sun. Las Vegas Sun. Retrieved September 22, 2011, from <http://www.lasvegassun.com/news/topics/water/>

Jarnik, P., & Donahue, R. (2011, June). Fairways Under Fire. *Landscape Architecture Magazine*, 101, 42-50.

History. (2010). (Official City of Las Vegas Web Site. Retrieved December 4, 2011, from <http://www.lasvegasnevada.gov/factsstatistics/history.htm>

Holmgren, D. (2005, March 30). Retrofitting the suburbs for sustainability | Energy Bulletin. Energy Bulletin. Retrieved November 9, 2011, from <http://www.energybulletin.net/node/5104>

Kenlo. (2011, March 8). Connected by Nature — Cities, people, and environment. Connected by Nature — Cities, people, and environment. Retrieved September 22, 2011, from <http://connectedbynature.com/>

Las Vegas: Economy - Major Industries and Commercial Activity. (n.d.). Stats about all US cities - real estate, relocation info, house prices, home value estimator, recent sales, cost of living, crime, race, income, photos, education, maps, weather, houses, schools, neighborhoods, and more. Retrieved October 4, 2011, from <http://www.city-data.com/us-cities/The-West/Las-Vegas-Economy.htm>

Las Vegas Foreclosures — Trulia.com .Trulia - Real Estate, Homes for Sale, Sold Properties, Apartments for Rent. Retrieved October 4, 2011, from http://www.trulia.com/for_sale/

Las Vegas Wash Coordination Committee. (n.d.). Las Vegas Wash Coordination Committee. Retrieved December 6, 2011, from <http://www.lvwash.org/html/>

Lost City Nevada - Reconstruction Of Adobe Structures. (n.d.). Hotel Reservations - Last Minute Bookings - Discounted Rates. Retrieved December 5, 2011, from <http://www.sunsetcities.com/lostcity/lost-city-reconstruction.html>

Newcomb, T. (2009, December). Green Mine. *Landscape Architecture*, 99, 94-102. zine | Retrieved November 28, 2011, from <http://www.districtadministration.com/article/new-school-opens-former-kmart>

Parker-Burgard, D. (2009, November 1). New School Opens in Former Kmart | District Administration Magazine. *District Administration Magazine*

Parks and Recreation: Wetlands. (2011, December 6). Clark County Nevada. Retrieved December 6, 2011, from www.clarkcountynv.gov/Depts/parks/Pages/wetlands-park.aspx

Postwar Suburbia Timeline of Important Dates. (n.d.). Shmoop: Homework Help, Teacher Resources, Test Prep. Retrieved November 30, 2011, from <http://www.shmoop.com/postwar-suburbia/timeline.html>

Schaffer, D., & Vollmer, D. (2010). *Pathways to urban sustainability: research and development on urban systems : summary of a workshop*. Washington, D.C.: National Academies Press.

Toadvine, M. (2009, October 29). Unveiling of G. Weaver Hipps' portrait marks school opening. Leigha Acres Citizen. Retrieved November 28, 2011, from www.lehighacrescitizen.com/page/content.detail/id/505882/Unveiling-of-G--Weaver-Hipps--portrait-marks-school-opening.html?nav=5100